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PULMONARY SUPPURATION—ITS DIRECT TREATMENT THROUGH THE BRONCHOSCOPE

A report of the work on pulmonary suppuration in the Laryngological Service, Mt. Sinai Hospital, New York City.

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The term pulmonary suppuration is here used to include lung abscess, bronchiectasis, pulmonary gangrene, and suppuration in association with neoplasms and with foreign bodies. The history of the treatment of pulmonary suppuration, with the outstanding exception of that due to the inhalation of foreign bodies, is a disappointing one. The frequent reports of lung abscesses in recent years, following both pneumonia and tonsillectomies under general anesthesia, have brought this question sharply to our attention and have served to emphasize the need for improvement in our method of treatment.

Medical treatment has been of little or no avail. At best it has been only symptomatic and chiefly expectant in character. Artificial pneumothorax has been tried as in tuberculosis and isolated successes have been reported, notably by Tewksbury.[1] Analysis of these reports shows that most of the favorable results were in acute lung abscesses of less than six weeks' duration. Acute lung abscesses exhibit a definite tendency toward spontaneous recovery. Wessler[2] reports that 33% of all cases of pulmonary suppuration recover spontaneously within two months. This fact must be borne in mind in considering the results of any form of treatment, whether pneumothorax, vaccine, or bronchoscopic. Our experience with pneumothorax is limited to observation in three cases. In each of these there was an immediate extension of the suppurative process, the collapse of the lung causing a dissemination of the infective material.

As early as 1904, attempts were made to treat pulmonary suppuration by the direct introduction of medication into the bronchial tree. In that year Jacob, Bougert, and Rosenberg[3] published their work, in which a catheter was introduced into the trachea and various solutions injected through it. In 1910, Ephraim and in 1912, Guisez[4] made similar attempts by introducing a spray into the subglottic region, under guidance of the laryngeal mirror, and injecting medication into the trachea. It is obvious that the solutions injected failed to reach the areas for which they were intended.

The rapid development of thoracic surgery in the past decade has offered a glimmer of hope to a few of these patients. To Sauerbruch, Lilienthal, Lenhartz, Robinson, and Meyer, credit is due for their brilliant work in this difficult phase of surgery and for some noteworthy operative results. The surgical indications are extremely strict, however, and the percentage of cases favorable for surgical intervention is very small. The operative mortality is high, various operators reporting from 35 to 70 per cent.

The fact remains that notwithstanding the various attempts at treatment, the large mass of patients with pulmonary suppuration have remained untreated and have lived the lives of social outcasts, their profuse and fetid expectoration as repulsive to themselves as to their friends and families. It is in the hope of calling attention to the possibilities in the direct treatment of pulmonary suppuration through the bronchoscope as suggested by Yankauer in 1916,[5] that this communication is presented. The cases cited are from the Laryngological Service of Mt. Sinai Hospital and from the private practice of Dr. Yankauer, and were treated either by him or under his supervision.

PULMONARY SUPPURATION WITH BRONCHIECTASIS AND GANGRENE

Pulmonary suppuration except in the very acute stage is always associated with some degree of bronchiectasis and gangrene. In addition, some of the cases are complicated by constriction of the lumen of the bronchus leading to the focus. This type of case will be discussed later. The bronchiectasis is especially marked in the more chronic cases. The pathology in this type of case emphasizes the difficulties with which the treatment must cope. There is present an extensive peribronchial fibrosis surrounding non-collapsing, suppurating, and gangrenous bronchiectatic cavities, from which frequently all vestiges of normal mucous membrane have disappeared. The process may be limited to one lobe or it may involve any number or all of them. Both lungs may be literally riddled with bronchiectatic cavities. As the spread of the disease is due to the infection of new areas by the inhalation of pus from infected areas, the lobes in-

volved are usually contiguous. This is not always true, however.

In this connection, it must be mentioned that the bronchoscope is the most exact means at our disposal for the localization of the suppurative foci. At times owing to the overlapping of the various lobes, it is even more reliable than the Roentgen findings. It has often been the deciding factor for or against surgical intervention. Eighty-two cases of pulmonary suppuration, exclusive of suppuration in association with foreign bodies and neoplasms, have been bronchoscoped for diagnosis or treatment. The following table shows the frequency with which the various lobes were found to be involved:

Bilateral, all lobes involved	6
Right lung, all lobes involved	12
Left lung, all lobes involved	7
Right upper lobe	13
Right middle lobe	5
Right lower lobe	20
Left upper lobe	7
Left lower lobe	8
Right middle and right lower lobes	2
Right middle and right upper lobes	1
Right upper and right lower lobes	1

The treatment consists in the regular irrigation with aspiration, at intervals, of the suppurative cavities. The bronchoscope is introduced into the focus or into the lumen of the bronchus leading to it, and by means of the double current canula devised by Yankauer, the irrigating fluid is injected into the suppurating area and the solution is withdrawn by aspiration. Continuous irrigation and aspiration are maintained until the solution returns clear. If more than one lobe is involved, the process is repeated in each involved lobe. Four to twelve ounces of solution are used with each irrigation. The irrigating fluid may be normal saline solution or one containing an antiseptic. After experimenting with various solutions we have found that clinically a weak iodine solution yields the most satisfactory results. Irrigations are commenced with a 1-1000 solution. The concentration is increased at intervals to that of a 1-400 solution.

The interval between the bronchoscopic irrigations varies with the condition of the patient and the response to treatment. If the expectoration is profuse and very fetid, the bronchial irrigations are given weekly. The interval is soon increased, however, as the expectoration and the cough diminish. At present some of our patients report for treatment monthly, some once every two, three or four months.

PULMONARY SUPPURATION WITH CONSTRICTION OF THE LUMEN OF THE DRAINING BRONCHUS.

This condition was present in ten cases in this series and caused definite interference with drainage in each. The bronchial constrictions can be diagnosed only with the bronchoscope and can be treated when present in the primary and secondary and occasionally tertiary divisions of the bronchi. The condition may be due to

1. *Inflammatory swelling of the bronchial mucosa.* This condition is frequently seen in acute pulmonary suppuration and in the acute exacerbations of chronic cases. We have seen a similar condition in a case of delayed resolution in lobar pneumonia. By treatment we have succeeded in aborting acute exacerbations. The treatment consists in shrinking the mucous membrane with cocaine and adrenalin and the application of a weak solution of silver nitrate or argyrol. This is followed by irrigation of the bronchus beyond the constriction. Case 3.

2. *Exuberant granulation tissue.* This may be found deep within the lumen of the involved bronchus but is more frequently present at its orifice. The main lobe bronchi are commonly involved and may contain sufficient granulation tissue to obstruct the drainage. In three of our recent cases, the right upper lobe bronchus was so completely occluded as to prevent the entrance of the bronchoscope into that lobe. The granulation tissue is cocainized, dried and cauterized with strong silver nitrate solutions. The bronchus is then irrigated beyond the constriction. Case 4.

3. *Cicatricial contraction.* This follows extensive ulceration of the bronchial mucosa and is commonly observed at the orifice of one of the lobe branches. It may also be due to syphilitic cicatrices of the bronchi, though we have not as yet observed this condition in the bronchoscope. We have seen and treated luetic strictures of the trachea but they were not associated with suppuration. Cicatricial contraction is treated by dilating the stricture with bronchial dilators and irrigating the pus focus beyond it. Case 5.

4. *Neoplasms.* These usually cause bronchial constrictions, but constitute a distinct phase in pulmonary suppuration and will be considered later.

5. *Post-Diphtheritic Stenoses.* Lynah and others have reported pulmonary suppuration in association with post-diphtheritic bronchial stenosis. We have had no experience with this type of case. Bronchial dilatation and irrigations are indicated.

6. *Other causes.* Narrowing of the lumen of a bronchus by extrabronchial conditions such as mediastinal growths, mediastinal cysts, interlobar empye-

mata, closed abscess cavities and aneurysmal dilatations is not within the scope of bronchoscopic treatment. The bronchoscope, however, has at times proved an invaluable aid in their diagnosis. We have seen pulmonary suppuration in association with each of these conditions.

RESULTS.

Therapeutic innovations in the field of medicine must inevitably contend with the skepticism of the medical profession and properly so. The bronchoscopic treatment of pulmonary suppuration has been no exception. As a consequence, we have had referred to us for treatment chiefly those cases of the more advanced and chronic type. The pathology would seem to preclude the possibility of permanent benefit from any type of treatment. Nevertheless, our results have been very encouraging. The first effect of the treatment is the complete cessation of the fetor oris. Coincident with this is a rapid diminution in the amount of expectoration and cough. Immediately following each bronchoscopic treatment, the cough and expectoration are at a minimum and not infrequently disappear for several days. There is an improvement in the physical signs as evidenced by an improved resonance, clearer breath sounds and change in the character and number of rales. Cavernous signs are frequently present after bronchoscopy when previously absent. It is of interest to note that following a bronchial irrigation, there is frequently a complete absence of rales, giving evidence of the thoroughness of the irrigation and of the completeness of the removal of the irrigating fluid by aspiration.

We have treated 29 cases of chronic pulmonary suppuration with repeated bronchoscopic irrigations and applications. Four of these patients have been cured, having received 102, 75, 40 and 14 bronchoscopic treatments respectively. They present no subjective or objective symptoms after an interval of one and a half years. Nineteen of the patients have been so improved as to the amount and character of expectoration and cough that they have been able to resume their respective occupations. Three cases failed to respond to treatment except for the cessation of odor. Three cases have died, one from a cerebral abscess, and two from extensive bilateral bronchiectases. In the series of 29 cases, 23, including the four cures, or 79%, have not only been kept alive, but the complete cessation of odor, the diminution in the expectoration and cough, and the improvement in the general condition has been such that these patients have been given a new lease on life. They have been able to take their place in society, continue with their work and resume a productive life. The change in mental attitude has been a notable factor.

Bronchoscopy with bronchial irrigation is not as trying a procedure as is generally believed. The patients report to the hospital, are bronchoscoped and treated, and return to their homes the same day. All are able to resume their occupations the morning following the treatment. To date we have given 1,054 bronchoscopic treatments with no un-toward results. We have had no single instance of pneumonia nor extension of the process following a treatment. Though some of our patients have been bronchoscoped over 150 times, with the exception of a slight hoarseness following the first or second bronchoscopy, there has been in no case a disturbance in the function of the vocal cords.

The following cases demonstrate some of the various phases of pulmonary suppuration encountered and the treatment of each.

CASE I. H. K., male, age 26, was admitted to the Laryngological Service Mt. Sinai Hospital, March 9, 1917, with a history of cough and expectoration for 15 years. He has had two attacks of pneumonia, at 2 and 10 years of age respectively. For the past 15 years he has had a cough with profuse expectoration, especially aggravated by change in position. The condition has been much more pronounced during the past year. The expectoration is fetid and averages 500 cc. daily.

Physical Examination—Fetor oris. Dullness left lung, from apex to base, with harsh bronchovesicular breathing and numerous crepitant and subcrepitant rales. Diminished breathing, crepitant rales at right base. Clubbing of fingers.

Complement fixation tests for syphilis and tuberculosis are negative. Sputum repeatedly negative for tubercle bacilli. Blood and urine negative.

Roentgen findings—Left lung occupied by dense irregular shadows containing many lighter areas, probably cavities. Recent infiltration, right base.

Bronchoscopic findings—Marked bronchiectasis left bronchus, extending into its primary and secondary divisions. Pus exuding from all visible branches in both lobes. Moderate bronchiectasis right lung.

The patient was treated with bronchoscopic irrigations, given weekly at first but with gradually increasing intervals. There was a progressive improvement in the cough and the amount of expectoration, with a complete cessation of both after 1½ years of treatment. In all, the patient received 95 bronchoscopic irrigations. He has been free from symptoms since October 1, 1918.

CASE II. N. R., age 32, was admitted to the Medical Service, Dr. Manges, Mt. Sinai Hospital, November 24, 1916, with a history of cough and purulent expectoration for 15 months. The past history is negative. The cough and expectoration had their onset 10 days following a tonsillectomy under general anesthesia and have grown progressively worse. Has oc-

casional free intervals of a week. The sputum is fetid, occasionally blood-tinged, and averages 200-300 cc. daily.

Physical examination—Thyroid gland enlarged. Signs of infiltration of right lung from apex to third interspace. Fingers clubbed. Enlargement of anterior and posterior cervical and inguinal glands.

Blood Wassermann and tuberculosis fixation tests negative. Sputum negative for tubercle bacilli. Blood and urine negative.

Roentgen examination—Dense infiltration, paravertebral portion of right upper lobe. There is also an infiltration extending along first interspace as far as axilla. No definite evidence of cavity.

Bronchoscopic examination—Right upper lobe bronchus filled with secretion and lumen dilated. Middle and lower lobe bronchi dilated but contain no pus.

The limited involvement and excellent general condition were favorable indications for surgical intervention and on December 11, 1917, Dr. Lilienthal performed a first stage operation in which he compressed the lung with packing. The patient refused the more radical secondary operation and was transferred to the Laryngological Service for bronchoscopic treatment. The treatment consisted in irrigation of the right upper lobe.

The improvement in this patient was particularly rapid. After receiving 14 treatments there was a complete subsidence of cough and expectoration. The patient has been free from symptoms for over two years.

CASE III. F. M., male, age 32, complains of cough and expectoration 3½ months' duration. The past history is negative. The present illness had its onset 3½ months ago, following a tonsillectomy under general anesthesia. One week following the operation, the patient began to cough. Cough accompanied with expectoration. Expectoration rapidly became profuse and fetid. Sputum at present averages 450 cc. daily.

Physical examination reveals an infiltration in right lung from apex to 4th interspace. Examination is otherwise negative.

Roentgen examination—Infiltration of upper lobe of right lung containing two small circular cavities.

Blood Wassermann negative. Sputum repeatedly negative for tubercle bacilli.

Bronchoscopic examination—Mucous membrane of right upper lobe branch swollen and congested, constricting lumen of bronchus so as to prevent entrance of bronchoscope. Pus in right upper lobe bronchus was irrigated weekly and weak solutions of silver nitrate were applied to the swollen mucosa. The patient has received but six treatments. The odor has ceased, the expectoration has dropped from 450 cc. to 90 cc. daily. The cough is markedly diminished. The patient has gained in weight. Treatment is being continued as outlined.

CASE IV. A. M., male, age 35, consulted Dr. Yankauer May, 10, 1920, complaining of cough and expectoration, 10 months' duration. Cough and expectoration followed an attack of pneumonia with pleurisy 10 months before and progressively increased. The expectoration is fetid. The patient has had frequent severe hemoptyses.

Physical examination—Fetor oris. Dullness, right lung posteriorly from apex to angle of scapula, with harsh prolonged expiration and numerous crepitant rales.

Bronchoscopic examination—Orifice of right upper lobe bronchus almost completely occluded with granulation tissue and exuding pus. Ulceration of bronchus just below orifice; probable origin of hemoptysis.

Treatment—Weekly bronchoscopic treatment was instituted. The granulation tissue surrounding the orifice was cocainized, dried and then cauterized with 20%silver nitrate. The ulceration was also cauterized. The upper lobe bronchus was irrigated. The patient has received 20 treatments. The first effect of the treatment was the cessation of the odor and the attacks of hemoptysis. The granulation tissue gradually disappeared and the bronchus became sufficiently patent to admit the bronchoscope. Coincident with this was a definite decrease in the amount of expectoration. The general condition has improved. The patient is still under treatment.

CASE V. S. H., male, age 27, admitted to the Medical Service of Dr. Manges, Mt. Sinai Hospital, May 7, 1917, with a history of cough and expectoration of 10 years' duration. The past history is negative. The patient has had a cough with mucoid expectoration for 10 years, etiology at time of onset unknown. For the past four months the expectoration has been very profuse and fetid and averages 300 cc. daily.

Physical examination—Fetor oris. Marked dullness, base of left lung with diminished breath sounds and diminished fremitus and a few large moist rales. Marked clubbing of fingers.

Blood Wassermann and tuberculosis fixation tests negative. Sputum negative for tubercle bacilli. Blood and urine negative.

Roentgen examination—Infiltration of middle portion of left lung posteriorly from level of sixth to eighth rib. Nature of infiltration cannot be ascertained.

Bronchoscopic examinations—Right bronchus dilated but contains no excretion. Stricture of left lower lobe bronchus just below orifice of left upper lobe branch reducing lumen to one-third normal size. Pus coming from both upper and lower bronchi.

Treatment—The stricture in the left lower lobe bronchus was dilated weekly with the bronchial dilator and both upper and lower lobes irrigated. During the first year the patient received 51 bronchoscopic treatments. The odor completely disappeared, the cough and expectoration greatly diminished. The patient was able to resume his occupation as a chauffeur. We have never succeeded, however, in completely freeing him of the cough and expectoration. He is still under observation and reports for treatment as soon as the expectoration begins to increase and cause discomfort. Bronchial lavage gives him relief for several

weeks. In all, he has received 130 bronchoscopic treatments.

PULMONARY SUPPURATION IN ASSOCIATION WITH NEOPLASMS.

The frequency with which neoplasms are at the base of pulmonary suppurations is not generally appreciated. In a series of 92 cases of pulmonary suppuration referred to the Laryngological Service of Mt. Sinai for bronchoscopic examination, there were present 10 cases of lung tumor, most of which were previously not suspected. Pathological examination of sections removed through the bronchoscope confirmed the diagnosis in each case.

The possibility of bronchoscopic treatment depends upon the location and size of the growth. Benign tumors protruding into the lumen of the bronchi can be removed with bronchoscopic forceps. In the following case of long standing suppuration, removal of fibroma of the bronchus by Yankauer and subsequent treatment with irrigations resulted in a complete cure:

CASE VI. The patient, L. R., male, age 40, was admitted to the Medical Service of Dr. Brill, August 26, 1916, with the following history. He had always been well, until two years before, when he contracted influenza. Following the influenza, there remained a persistent cough with expectoration. The cough became progressively more severe, with a rapid increase in the amount and the appearance of fetid expectoration. This persisted. For the past year the fetid expectoration averaged 250 cc. daily. He has had an occasional hemoptysis.

The physical examination and the Roentgen examination show an infiltration in the left paravertebral region from the level of the fourth to the eighth dorsal vertebra. There is no evidence of cavitation.

The bronchoscopic examination reveals the entire lumen of the left bronchus, about 2 cm. below the bifurication, to be filled with a growth. The growth was covered with normal mucous membrane. Small pieces were removed with forceps, making a lumen 3x5 mm.

Pathological diagnosis of the specimen removed: fibroma.

Examination of the chest 15 minutes after the bronchoscopy showed a marked improvement in the resonance, voice and breath sounds.

One week later the patient was again bronchoscoped and the remnants of the tumor removed. The site was cauterized with a 20% solution of silver nitrate and the bronchus then irrigated.

Bronchoscopic lavage was performed weekly for several months. There was an immediate cessation of the fetor and a gradual progressive diminution in the cough and expectoration. The interval between treatments was rapidly increased. The patient was under treatment for two years, during which period he received 75 bronchoscopic irrigations. The complete cessation of cough and expectoration rendered further treatment unnecessary.

Malignant Neoplasms—Until recently, difficulty in securing radium has prevented us from making direct applications to malignant neoplasms through the bronchoscope. At present, however, we are treating a case of carcinoma by this method. The patient tolerates the radium capsule in the bronchus for hours without discomfort.

SUPPURATION IN ASSOCIATION WITH FOREIGN BODIES IN THE LUNG.

Mention is made of this phase of pulmonary suppuration only to emphasize the fact that foreign bodies may be present in the lung without history of inhalation and may not be revealed by the Roentgen rays. The frequency with which unsuspected foreign bodies have been found in cases of pulmonary suppuration makes it imperative that every case be submitted to bronchoscopic examination. The first case of lung suppuration to be bronchoscoped at Mt. Sinai Hospital for therapeutic purposes revealed the presence of a foreign body—the vertebra of a chicken—in the involved bronchus. There was no clue in the history or Roentgen examination. The following case is also instructive:

CASE VII. A. S., male, age 3, admitted to the service of Dr. Lilienthal, Mt. Sinai Hospital, November 19, 1917, with a history of cough and fever, three weeks' duration. The past history was negative except for pneumonia five months ago. For the past three weeks the patient has had a spasmodic cough with expectoration. Expectoration never fetid. The temperature has ranged from 100° to 104°. Physical examination shows typical signs of a pneumonic consolidation at the left base and a marked clubbing of the fingers, but is negative otherwise. The *x*-ray reveals an infiltration of the lower part of the left lung with a small circular cavity in the upper part of the infiltration. The unusual *x*-ray findings, the rapid clubbing of the fingers, with the acute history were a distinct indication for bronchoscopy. The patient was bronchoscoped by Dr. Yankauer and two pieces of the kernel of a nut were found in the left bronchus and removed. The patient received two bronschoscopic irrigations and, with the exception of the clubbing of the fingers, made a complete recovery.

SUPPURATION DUE TO SPECIFIC INFECTIONS.

We have had no experience with the bronchoscopic treatment of suppuration associated with specific infections such as tuberculosis and syphilis. We believe, however, that the bronchoscope may be destined to play an important role in the treatment of tuberculosis, at least in the treatment of the superimposed secondary infections. We regret that the tuberculosis material at Mt. Sinai Hospital has been so limited as not to have permitted our carrying out work along this line. Suppuration in association with syphilis, the so-called luetic phthisis, does not require bron-

choscopic treatment. The possibility of its presence should be remembered.

The work on pulmonary suppuration here presented, though extensive, is not of sufficient magnitude nor duration to permit the drawing of sweeping conclusions. We merely wish to emphasize the method of treatment and the results obtained, in the hope of stimulating further interest and work along similar lines. As our methods of treatment and technique improve with experience, and as we establish the confidence of the internists and are permitted to treat cases earlier in the disease, the results will undoubtedly improve. The bronchoscopic treatment of pulmonary suppuration and other pulmonary conditions is in its incipiency. The possibilities are almost unlimited. The bronchoscope should be as important a factor in the treatment of lung conditions as is the cystoscope in the treatment of bladder conditions. The present apparently limited field of bronchoscopic therapy is destined to expand into one of vast usefulness. The direct treatment of pulmonary suppuration is proving its efficacy and gives evidence of the trend in that direction.

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WORLD-HERALD BUILDING.

SURGERY OF THE KNEE: MENISCI, CRUCIAL LIGAMENTS, AND ARTICULAR CARTILAGES.

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The recognition of traumatic lesions of the menisci, crucial ligaments, and articular cartilages has made little progress in France. These lesions are rarely recognized and rarely operated upon. We believe, however, that these traumatic lesions are an important if not the most usual cause of certain chronic conditions of the knee, which are still being treated without surgical efficiency. How many people are suffering from what was originally called a sprain, who develop chronic states characterized by frequent painful accidents to the knee, progressive atrophy of the thigh recurrent hydrarthroses? The symptoms are usually relieved by rest only to recur as soon as work is resumed. Massage, compression, hydrotherapy fail to relieve or cure. The failure is due, I believe, to an original injury to the meniscus, the anterior crucial ligament, or the articular cartilage, and relief can be obtained only by surgical repair of the causal lesion.

The failure to recognize these lesions cannot be explained by their comparative infrequency in France as opposed to the Anglo-Saxon countries. The fault appears to be due to the inadequacy of arthrotomies performed, and to the tendency to over-emphasize the importance of the menisci.

The lateral, vertical and horizontal incisions, as presently used, are sufficient to expose the meniscus, but that is all. These incisions do not permit complete exploration of the knee joint. If then the surgeon does not immediately find the suspected lesion in the meniscus, he is faced with the alternative of closing the wound or uselessly removing a meniscus. At the present time fear of infection should not deter us from attempting the most thorough possible exploration of the knee joint.

Two methods of arthrotomy are at our disposal, both of them good, both permitting perfect restoration of the joint. They have been employed for several years in foreign countries.

Vertical, Median, Trans-Patellar Arthrotomy is simple. The incision is made in the quadriceps above the patella, in the patellar ligament below the patella, and completed in my two cases, by the liberation of the patellar ligament from the tubercle of the tibia. This permits the dislocation outward of each half of the patella onto the anterior surface of the femoral condyles. The exposure is perfect. The only disadvantage is the slight intra-articular bleeding which occurs from the cut edges of the patella.

The second method is to cut *a large U-shaped flap,* of which the horizontal branch passes underneath the tubercle of the tibia, which is cut with the chisel or Gigli saw. A large flap can then be raised upwards, consisting of the insertion of the patellar ligament, the patellar ligament, the patella, and a portion of the capsule. The exposure is the same as in the first method. The repair is effected by re-attaching the tuberosity with a screw or by carefully placed fibro-periosteal sutures. The advantage of this method is the absence of bleeding, but the operation is longer than with the first method.

It goes without saying that with either method, the suture of the synovia, capsule, muscles, and pre-patellar tissues should be most carefully performed, with fine suture materials. This is absolutely essential in order to obtain good functional post-operative results.

MENISCI—The two cases which I observed presented absolutely typical histories. Both were adults. In one the original injury dated back five years and was acquired at football, the other dated back only five months and was acquired at ice skating. In both cases the typical locking occurred with increased frequency, and on minimal effort. The locking was accompanied by the usual symptoms of sudden acute pain, in the internal part of the knee, with immobilization in semi-flexion. Under the influence of rest and progressive traction, reduction would be accomplished, and after a few days the patient would resume his occupation, but with a leg more feeble, less sure and more atrophied after each locking.

I operated upon these two patients. The first through a simple lateral incision, the other through a tranverse incision dividing the patellar ligament. The first incision is insufficient, not permitting extensive exploration, the second is mutilating and I now prefer either vertical section of the patella or the detachment of the tubercle of the tibia.

In both of these cases, the internal meniscus was found completely detached, atrophied, and deformed, and in the case of long standing, twisted on its axis, almost filiform in thickness, and sliding backwards and forwards between the two tibio-femoral articulations.

This is the easiest type of meniscus separation to diagnose, when the torn meniscus is caught between the two articular surfaces. But in certain cases of very long standing, the course may be quite different, and the diagnosis may be a little more difficult. In this type the frequent locking of the joint, and its functioning under abnormal conditions, has created an inflammatory condition, and manifested by a chronic hydrarthrosis, pronounced atrophy and progressive weakness. The painful locking is now not so necessary to the diagnosis, but in all cases it has occurred at some period of the disease. There is a history of trauma, which should direct suspicion to the mechanical origin of the disease. However, only a complete exploration of the joint will produce a definite diagnosis, and allow a rational therapy.

CRUCIAL LIGAMENTS—A review of the recent literature on this subject seems to show that while in France the tendency has been to operate too little, in England the contrary is true. Over-emphasis on the importance of lesions of the meniscus has led to the removal of many healthy menisci, unnecessarily, in the same way that many healthy appendices are removed.

As with appendicitis the causes of error are numerous! In the first place the hitherto insufficient exploration of the knee-joint, and in the second place the over-emphasis on lesions of the meniscus and overlooking of lesions of the anterior crucial ligament.

The pathognomonic symptom of a torn or dislocated meniscus is a painful locking of the joint. The other symptoms, hydrarthrosis, atrophy, and weakness are secondary, and occur also in other pathological conditions in the knee joint.

When an operator, in expectation of finding a torn or displaced meniscus, finds an apparently normal one, he is very much in the same predicament as the surgeon who has found a normal appendix unexpectedly. A slight redness or increased mobility has been sufficient indication for removing the meniscus, or performing a meniscopexy.

In reviewing the abundant statistics published by the English, one is struck by the fact that whereas the results are remarkably good in those cases where the meniscus has been definitely torn or displaced, they have been practically very mediocre or poor in those cases where the lesion was not definitely present. *The reason for this lies in the fact that the true pathological condition was overlooked because of the inadequacy of the incision usually employed.*

In addition, as pointed out by Alwyn Smith, it is often possible to have with a true lesion of the meniscus, a coincident tear in the anterior crucial ligament. It is therefore conceivable that ablation of the meniscus alone without further exploration has accounted for a certain number of failures, even where a torn meniscus was definitely repaired.

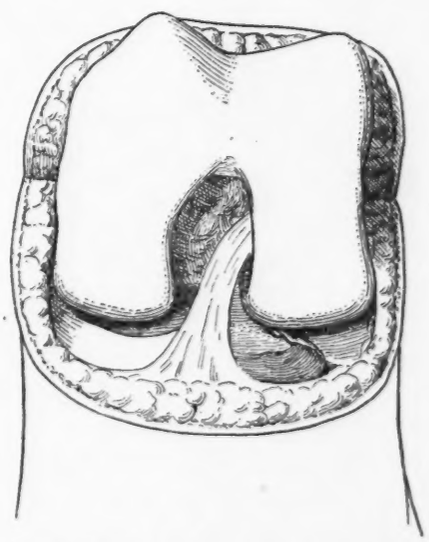

Fig. 1. Old displacement of the internal meniscus. The meniscus, filiform, is turned on itself, passing directly between the two articular surfaces of the femur and tibia.

Wide access to the joint will minimize the number of errors, and therefore whenever arthrotomy is per-

formed, the exposure should permit a satisfactory exploration.

Without going into the details of the physiology of

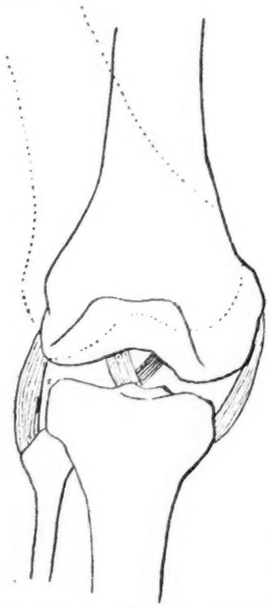

Fig. 2. The movement of abduction causes the most tension on the internal lateral ligament and the anterior crucial ligament. (After Corner).

the crucial ligaments, the important fact is that these ligaments are the strongest connections between the

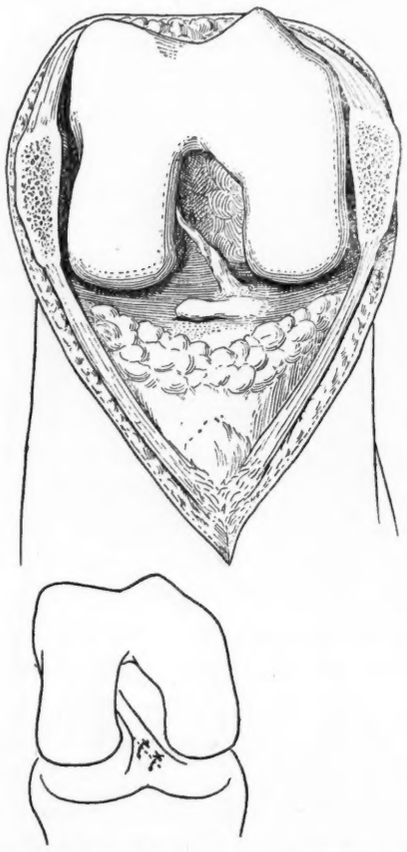

Fig. 3. Case I—Almost complete rupture of the anterior crucial. Ligament sutured.

tibia and the femur. Any weakness in these ligaments causes a laxity in the knee joint. *The syndrome of torn meniscus is essentially characterized by pain, the syndrome of the crucial ligament tear is essentially one of laxity and weakness.* At the onset there is usually a profuse hemarthrosis, followed later by increased lateral motility, progressive weakness, lack of confidence in the affected limb. The patient fears to put his entire weight on the injured side and there is resulting atrophy. The symptoms occurring with painful accidents resulting from a "pinching" of the fragment, so frequently in "old sprains," in "intermittent hydrarthrosis," should direct suspicion towards the possibility of a rupture or displacement or atrophy of one of the crucial ligaments.

It is nearly always the anterior crucial ligament which is affected. In causation it is similar to that of tear of the internal lateral ligament. Both of these

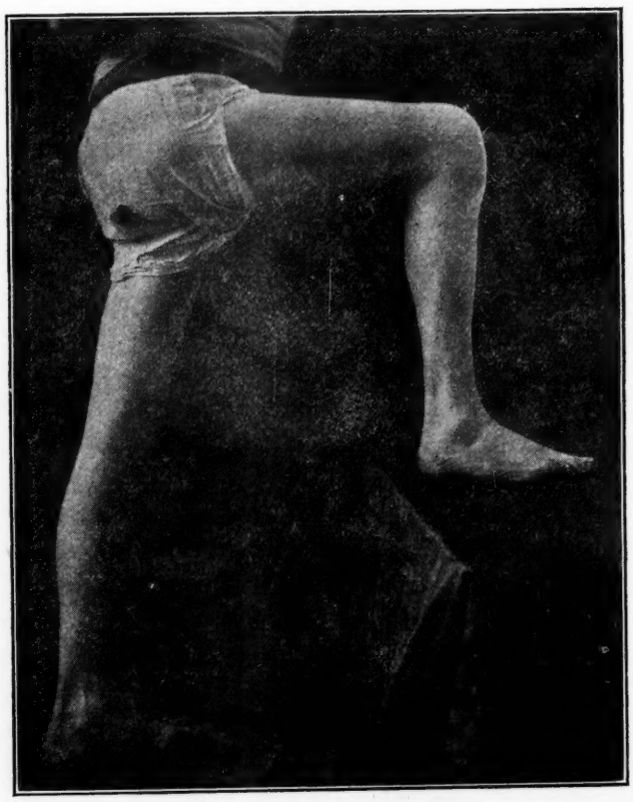

Fig. 4. Case I—Rupture of anterior crucial ligament of the knee. Vertical, median, trans-patellar, arthrotomy. Suture of the ligament. Condition two months after the operation. Right knee.

ligaments suffer similarly when the knee is flexed, externally rotated, and abducted, which is the position in which most traumatisms occur.

Following are two cases of rupture and of relaxation of the anterior crucial ligament.

CASE I. L———, 19 years. First injury three months previous. While vaulting a fence, he fell, had severe pain in knee and was unable to rise. Immediate swelling of the knee. Six weeks of massage and the patient resumed work. Since then, frequently after mis-steps, he has had violent pain and

immobilization of the leg for an instant. Recently these attacks have become more severe, the last one, especially bad, bringing him to the hospital.

The knee was swollen and fluctuating; thigh markedly atrophied; flexion limited to a right angle; lateral motility; *x*-ray shows nothing abnormal.

Operation, December 3, 1918, at Hospital 34, Troyes. (Assistant M. Fournier; ether, M. Bureau.) Vertical, median, transpatellar, arthrotomy. Vertical section of the patellar ligament. Separation of this ligament from the tibia, at the tubercle of the tibia. The articulation contained blood, but no clots. Menisci intact. But the anterior crucial ligament was almost completely torn, shaped like a flattened stump, resting flat on the tibial surface, and attached only to the tibia. It was covered by a layer of fibrin, which when lifted off, disclosed clearly its ligamentous structure.

Behind this stump and hidden by its fatty fringes, there persisted the deeper portion of the ligament which maintained its tibial and femoral insertions. To this intact portion I sutured the torn tibial end of the ruptured ligament with fine linen suture. Suture, of the synovia, the capsule, periosteum of the patella (fig. 3). Plaster cast.

On the ninth day the cast was removed. On the twelfth the patient was out of bed, and began regular active exercises in flexion and extension of the knee.

On February 6, 1919, two months after the operation, there was flexion to a right angle, only slight "floating" of the patella, the knee was much more solid than before the operation, the acute painful accidents and locking had not recurred, and the atrophy of the quadriceps was slowly improving. (Fig. 4.)

CASE II. V————, 20 years old. Beginning of trouble dated back six months. In attempting to throw a hand-grenade he fell, had very severe pain in the right knee, and at the same time he felt something crack. Progressive swelling of the joint. Massage and cautery. At the end of three weeks he returned to service. Since then he noticed occasional sharp flexion of the joint, culminating in a second acute accident similar to the first, which brought him to us.

The knee is large, painful, especially anteriorly, around the patellar ligament. Extension fairly complete; flexion limited to a right angle; lateral mobility; atrophy of the thigh. Walks with a limp, and has sensation of extreme weakness in the limb. Radiograph is negative.

Operation, January 2, 1919, at Hospital 34, Troyes. (Assistant, M. Fournier; ether, M. Bureau). Median, vertical, trans-patellar, arthrotomy, vertical section of the patellar ligament, separation of the insertion of the patellar ligament at the tubercle. Hemarthrosis. Menisci intact. The anterior crucial ligament very loose and swollen. The laxity was diminished by suturing the tibial portion to the fibrous formation in the vicinity. (fig. 5). Suture of the synovia, capsule, patellar periosteum. Plaster cast.

On the ninth day, removal of cast and sutures, patient out of bed, physical therapy begun.

On February 6, 1919, 34 days after the operation, there is still a slight swelling of the knee. Flexion is still limited to 95°, (fig. 6), the patient has the sensation as if the anterior part of the knee had been shortened. There is still slight lateral mobility, less marked than before the operation. The patient states that his knee feels more solid. Sudden flexion no longer occurs, his walk is normal, even rapid. He ascends stairs easily, descends stairs with slight hesitation when the injured knee is flexed the sound leg is brought to the step below.

The reparative work which is performed in the narrow inter-condylar channel, should be done with fine and short needles. Besides the handicap of the narrow working space, the suture of the ligament is

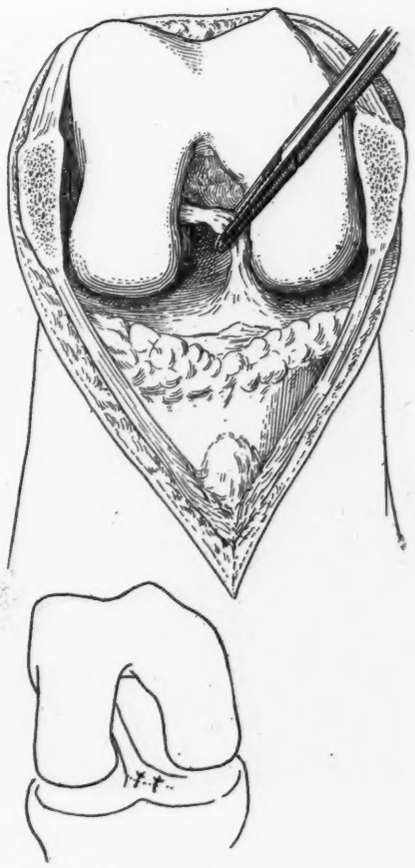

Fig. 5. Case II—Laxity of the anterior crucial. Suture of the ligament. Right knee.

not a particularly easy problem, and numerous methods have been devised.

Corner has attempted to shorten and tighten the ligament by what he terms "reefing" the ligament. The suture is passed through and around the crucial ligament, the two ends are carried through the external condyle and tied on its subcutaneous surface (fig 7.) Thus after a fashion the ligament is hugged against the articular surface of the condyle and held taut. The question may be asked whether this tension is adequate and especially whether it is permanent.

Moreover, all operations performed upon a diseased ligament more or less atrophied, relaxed or torn,

are open to the same criticisms, as all plications or "pexies." The repair has little value because the tissues used are poor material.

Much more interesting are those operations which attempt to create a new crucial ligament either with a strip of fascia lata for the anterior crucial, or a strip of semi-tendinosus for the posterior crucial (exceptional case).

These operations have been performed by Hey Groves, later by Alwyn Smith, whose complicated operation proposes not only to restore the crucial ligament, but also to reinforce the internal lateral ligament. The knee is widely exposed by a large U-

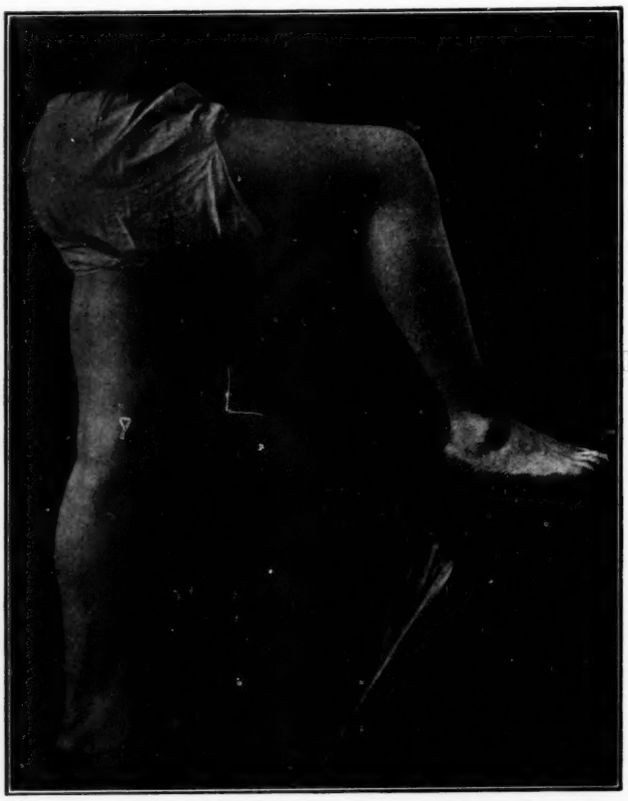

Fig. 6. Case II—Relaxation of the anterior crucial. Suture. Condition 34 days after operation. Right knee.

shaped incision, the inner limb of which extends upwards to the middle of the thigh. A narrow strip of fascia with its pedicle below is cut in the fascia lata. The knee is opened and the external femoral condyle and then the internal tibial condyle are crossed by osseous tunnels the intra-articular orfices of which correspond to the points of insertion of the anterior crucial ligament to the femur and tibia. The fibrous band is passed through this tunnel by means of a catheter in whose terminal eye is threaded the end of the fascial strip. The knee is now extended, and the fascial strip sutured to the periosteum of the tibia and the neighboring fibrous tissue. Here the operation of Hey Groves stops. (fig. 8.)

Alwyn Smith, in order to reinforce the internal lateral ligament, cuts a strip of fascia long enough to be carried upwards on the internal surface of the joint. It lies in another osseous tunnel made in the superficial part of the internal condyle of the femur, passing up to the tubercle where the third adductor is attached. At this point the strip of fascia is anchor-

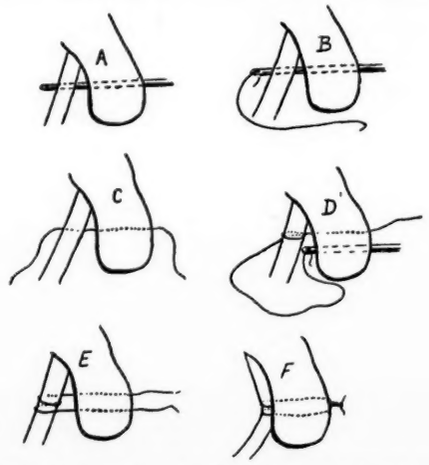

Fig. 7. Corner's operation for tightening a relaxed ligament.

ed (fig. 9). These operations seem to have given good results. Their true value will depend upon a larger experience.

ARTICULAR CARTILAGES—I have observed one case in which there was a fracture of the articular cartilage of one of the femoral condyles, and in which the fragments acted as cartilaginous free foreign bodies.

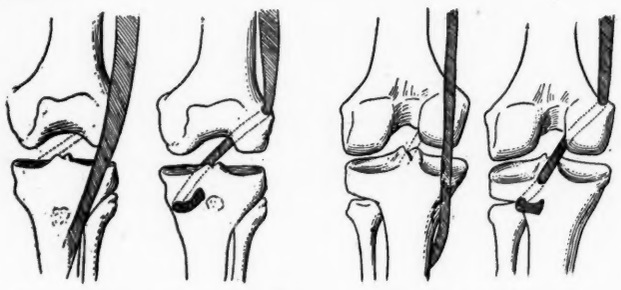

Fig. 8. Operation of Hey Groves. Left: Construction of an anterior crucial ligament from a strip of fascia lata. Right: Construction of a posterior crucial ligament from the semi-tendinosus.

CASE III. D—,23 years old. In July, in falling from a vehicle, he twisted his leg in extreme rotation and arose with difficulty. Articular effusion. After ten days in bed he returned to duty. Then in December two similar accidents, one while jumping from an automobile, the other in making a severe bodily effort. In addition there are constant sensation of weakness, limitation of movements, and on severe effort pain on the internal aspect of the knee. The knee is swollen and fluctuating. Pronounced pain at the site of the internal meniscus. Flexion to right angle only. Lateral mobility in extension. Considerable atrophy of the thigh. Radiography negative.

Operation, December 30, 1918, at Hospital 34, Troyes. Assistance as in Case II. U-shaped incis-

ion. Section of the tuberosity of the tibia. The entire joint is exposed.

The following lesions were discovered: 1. A free oval shaped cartilaginous foreign body, resting on the internal tibial plateau, 2 cm. by 1 cm. in area, and

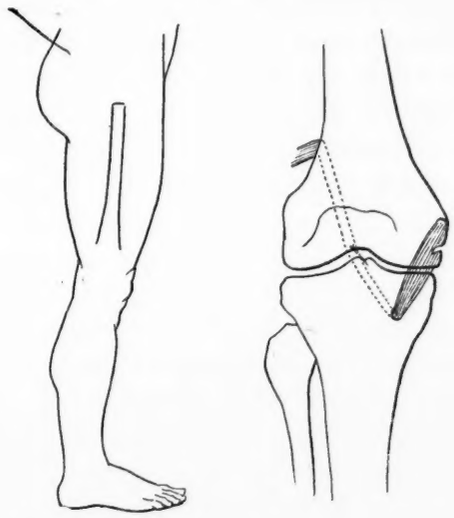

Fig. 9. Operation of Alwyn Smith for the restoration of a ruptured anterior crucial ligament and the reinforcement of the internal lateral ligament. Left. Cutting the strip of fascia. Right: The flap traverses the femur and tibia, and is attached to the adductor tubercle.

2 mm. in thickness. One of its surfaces was perfectly smooth, the other slightly rough and striated. 2. A pedunculated mobile foreign body, 1 cm. by 5 cm.

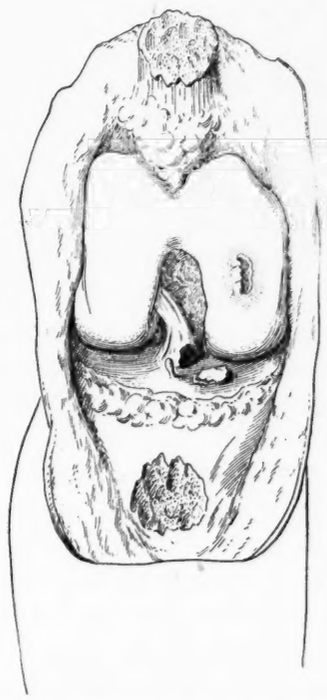

Fig. 10. Case III—Fracture of the articular cartilage. Free and pedunculated foreign bodies. Right knee.

attached to the intermeniscal ligament by a band which we divided. 3. A free foreign body, soft, probably consisting of a fringe of synovia. 4. On the articular surface of the internal condyle there was a loss of substance of the cartilage equivalent in size to the dimensions of the foreign bodies. All around this area, the cartilage was dull and grey, and at the outer edge of the denuded area the loss of substance was limited by a fragment of cartilage, almost entirely detached and ready to separate. Excision of this fragment. The menisci were intact. Suture in the usual fashion. Plaster.

On the ninth day, plaster and sutures removed. On the twelfth day out of bed, beginning to walk and taking graded exercises.

On February 6, 1919, 38 days after operation, flexion almost normal. Patient walked without pain or limp. All sensation of weakness or giving way had disappeared, except in going downstairs. Ascends stairs easily. Cannot run.

On April 25, the patient could run and play foot-

Fig. 11. Case III—Right knee. U-shaped Arthrotomy, with section of the tubercle of the tibia. Removal of foreign bodies. Condition of the knee 38 days after operation.

ball. Slight amount of fluid in the joint. Flexion normal.

This is a typical case in which clinical diagnosis was absolutely insufficient, and in which the condition could be cleared up only by wide exposure.

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MEATOTOMY—ITS INDICATIONS AND TECHNIQUE.

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It quite frequently becomes necessary to enlarge the male meatus urinarius for purposes of instrumentation for the diagnosis and direct treatment of intra-meatal lesions. The latter, however, do not call for such interference as often as an abnormally small meatus, that has to be amplified for the insertion of instruments to relieve *deeper* urethral lesions. In suspected affections of the fossa navicularis especially in the involvment of the glands of Littre, and the follicles of Morgagani, it is good diagnostic sense to locate the lesions endoscopically; with an abnormally small meatus, however, this is impossible. The operation of meatotomy aids us materially in the treatment of the above conditions; it is of far greater importance, however, in deep seated lesions invading the pendulous membranous or prostatic segments of the urethra. But when a meatus does not admit the requisite caliber and kind of instrument, we are unable to reach the seat of the pathologic process, and in all such cases a meatotomy is indicated.

INDICATIONS FOR A MEATOTOMY.

What constitutes a normal meatus?

Under normal conditions the size of the meatus is a negligable factor, so that we cannot definitely lay down criteria as to the physiological size of the orifice. But in pathological states, we must ask ourselves what is the smallest size of the meatus compatible with the proper treatment of deep urethal affections?

If small caliber strictures are taken into consideration, then No. 20 orifices may be regarded as of sufficient size for dilatation up to twenty-two mm. But if urethroscopic or other instrumental intervention is called for, a twenty mm. opening, though perhaps sufficiently adequate for ordinary purposes and observations, may and does offer serious difficulties, when we have to remedy large caliber strictures from 20 to 35 or 36 mm. A meatus of 20 mm. offers a considerable obstacle, especially so when the deeper urethra is patulous enough to admit a sound of large caliber. We can thus formulate almost axiomatically that for endoscopic intervention and dilatation of large caliber strictures a meatal orifice of only twenty mm. is sufficient indication for meatotomy.

TECHNIQUE OF MEATOTOMY.

Meatotomy is a singularly simple operation that does not call for superior surgical skill, nor for any array of complicated surgical apparatus. A sharp scissors, either curved or straight (I prefer the latter), a few hemostats, a fine wick of gauze, a probe, a four per cent. solution of procain, solution of adrenalin, 1 to 1000, and dressings are all that are required. A pledget of cotton, well saturated with the procain solution, is inserted into the meatus and retained for ten minutes; the glans is well sterilized with sublimate of lysol solution, the pledget of cotton is then removed and the meatus is lightly touched with the point of the scissors, so as to determine whether its sensitiveness has been thoroughly abolished. If it still remains sensitive, we must repeat the procainization of the meatus. The scissors are then introduced into the meatus, the penis elevated at right angles with the body, the lower blade impinging upon the mucosa, the upper blade externally to it in juxtaposition to the lower blade; and thus bringing the blades together with one sweep, the meatus is divided. The question may be asked to what caliber should it be enlarged, and how can we gauge the extent of the enlargement? In order to establish a free and patent meatus, we must think of the possibility of shrinkage and cicatrization that is apt to follow after healing has taken place. We must not be sparing in our efforts to maintain a fairly large orifice; consequently the urethra should be divided to the size of 26 mm., which in the course of healing is invariably reduced to 24 or 25 mm.

How can we measure the extent of a meatotomy to correspond to a 26 caliber sound? This is a personal equation and depends upon the judgment and experience of the operator. But with repeated practice one readily acquires the ability to judge. After the incision has been made, there may be considerable bleeding, which is readily controlled either by the hemostats, which is very rarely necessary, or by ordinary compression by the subsequent dilatation with sounds. A 24 sound is introduced, rapidly advanced to 26 mm, and collectively retained for ten minutes. A fine wick of gauze, saturated with chlorotone oil, is inserted into the meatus and the penis is bandaged. The patient is told to remove the dressing upon the first attempt at urination, to withdraw the wick and to spread the enlarged meatal lips five or six times a day with his fingers, so as to obviate adhesion of the cut edges. He must be cautioned to have his hands thoroughly washed before attempting this. The patient is to return daily for six subsequent days, and the same collective dilatation repeated as on the first occasion. It is advisable to lubricate the meatal lips either with chlorotone oil or petrolatum and to have the wick of gauze retained at least one hour after dilatation. The entire process occasions very little pain or discomfort; the subsequent dilatation

of the enlarged meatus prevents its premature closure or its undue subsidence to less than 24 mm., which would frustrate our end in view. Complete healing ensues within two weeks, after which instrumentation and the necessary therapeutic measures may be carried out with the free and large meatal orifice thus established. At times we note encircling the severed edges of the meatal lips, a tightly adhering film or pellicle, the first attempt at cicatrization, which disappears in the course of time. No untoward after-effects have been observed in my cases, and no complication whatever need to be anticipated if proper asepsis has been employed.

In conclusion, it may not be amiss to emphasize the fact that aside from the patency of the meatus thus afforded by the operation for purposes of instrumentation or therapeutic measures, it is also conducive to better drainage of secretions, which would otherwise be retained, or only partially discharged if we had to deal with an abnormally small orifice.

507 FINE ARTS BLDG.

HAS THE RUBBER GLOVE SOLVED THE QUESTION OF HAND INFECTION?

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Some apology is due the earnest profession at this late date for the selection of this subject. It has never been sufficiently clear to me just why we are not able to teach surgical cleanliness to the majority of our profession. The more I live the surgical life, the more forcibly is the fact impressed upon me that a very few can be taught ideal surgical cleanliness. The brilliant student of today, educated to the ultimate degree, comes to us with a very feeble idea of just how to get and keep his circle of surgical cleanliness. To him who received his education in surgery, or rather who undertook surgery late in his life, say fifty, it is hard, indeed, and next to impossible, to teach a refined degree of surgical toilet of the hands.

As a student, it seemed to me not necessary to give a prolonged course of lectures on asepsis; the single statement that the habitat of bacteria was ubiquitous should have been sufficient to teach the unyielding rule of hands-off of all unsterile surroundings. It should have remained only for the teachers to demonstrate the methods by which refined degrees of surgical cleanliness can be obtained. This, unfortunately, is an indefinite factor, and must ever vary with the psychology or mental attitude of the teacher as to what is the most refined degree of surgical cleanliness. One teacher talks about length of scrub, another about system of hand-scrubbing, another says little about scrub, and much about the rubber glove; another talks fluently about asepsis and antisepsis, and but feebly practices either.

It is very difficult to define, corner or circle the subject on account of operators' attitude as to what is right. For instance, I illustrate from a personal experience: Two operators dealing in critical comment, one a believer in long scrub and operating with glove-less hands, condemns another who believes in gloves and takes an inferior scrub. I was condemning both; the long scrub had not been conducted with system and method, and the gloved operator was condemned on account of his very inferior scrub, and the liberty he early took with gloved hands. So, here are three opinions of what each considered right. There is but one answer, and it howls with truth, namely, results. It is ignorant, unnecessary and unscientific that there has not been a consistent and gradual elimination of operative infection from the dawn of asepsis to the present day.

Much I see in surgery has been of gross neglect in carrying out the fundamental principles so well established. Have men the patience to get clean? Have they sufficient habits of industry to do so? Have they the actual strength and endurance to get clean? Can they think constantly in the circle of cleanliness? The late Dr. Price so often said that abdominal surgery should be done by the surgical prize-fighters of our country, by which he merely meant that it took much strength, endurance and habits of industry to make the proper toilet of one's hands and stand the blow of surgery. In any month's history of the Joseph Price Hospital the time consumed in the toilet of the operator and assistant's hands, has been greater by far than the time consumed in the actual operation, and we talk little about length, but much about the system of the scrub. It has been my observation for some years that puerperal infection is on the increase. Statistics of large insurance companies and many publications are at present confirming such observation. We are not any more unclean in our obstetrics than we are in our surgery, but neglect is stamped upon the obstetrical patient because she represents a single type of case and one of high mortality,—a fact registered by the death certificate. The mortality in abdominal surgery is much too high. Substitutions are double-edged instruments; be careful of the conscience appeasers in surgery. Best results do not come as accidents, nor are they obtained along lines of easiest

execution, but are achieved only through earnest habits of scientific industry. There is a very definite limit to the number of major operations any operator can perform with the very best results. He has his legitimate limit, more is reprehensible. I question, and the courts, I believe, sustain me, whether any operator is within his professional rights when he does not finish the operation he began. A great abdominal surgeon said to me, he could tell from the convalescence of his patients whether a second finger had entered the abdominal cavity. I believe the best results are just so sensitive. Abdominal surgery will not inherit its own until such refinement is lived up to. That great cricle of assistants, which is too often seen in public clinics, must be shortened. Too many hands, too many possibilities for error. Simplicity is mighty in abdominal surgery.

In review of one thousand re-operations in abdominal surgery performed in my institution, ninety-nine per cent showed adhesions to or lateral to the scar. Most of these operations had been by operators with gloved hands. One could not claim that all such adhesions came from infections; other sources such as trauma, imperfect surgery, rough use of instruments, the materials used, etc., must be taken into consideration. About seven per cent of our own cases, re-opened subsequently, showed signs of adhesions, yet we do not use the rubber glove.

Can you teach men to scrub their hands? I doubt it. Should the rubber glove be put on the hand of the man who will not scrub, and not on him who will? Loss of time, extra trauma, less perfect work, poorly scrubbed hand in the imperfect glove, may be fair to consider attributes of the rubber glove, and must be pitted against the ungloved clean hand with all its natural abilities. How much work can the perfectly scrubbed hand stand? If you force me to committal I say, the imperfectly scrubbed hand is the source of infection, the rubber glove has not solved the question of hand infection, and has obtunded the aseptic conscience of the operator who takes privileges with the glove he would not take without it. The scrub of many operators who wear rubber gloves is a perfect farce.

HAND SCRUBBING.

The teachers must stop talking so much about the time required in hand toilet, and talk more about the method and system of the scrub. In the Joseph Price Hospital we use six different brushes and as many different basins to scrub in. Analyze the scrub of one who begins and ends with the same brush, and it must be apparent that the brush in the first twenty seconds contains ninety-nine plus per cent of the filth of the hands and continues to be diluted only as the hand scrub goes on; it is never perfect. The change of brush and receptacle is all important and most imperative. The scrub requires just as much mental concentration, and is the hardest work I do, and the most important. The hand-scrub in the Joseph Price Hospital is done with as much West Point discipline and organization of technique as we are able to carry out.

The hand is first washed with soap under a running stream before the first brush is used. A gross portion of the cleansing is thus accomplished before the first brush is contaminated. The scrub is then continued through six large receptacles or basins with six changes of brushes; the hand and fingers being scrubbed in hyperflexion and hyperextension in order that the crevices and wrinkles may be effaced, enabling the brush to pass thoroughly over the entire surface of the skin. Each finger is given a special toilet; the nail cleaner should be used several times as the scrub goes on; once is not enough. The scrub ends in the alcohol basin. There is just as much mental effort used in this preparation as there is in the operation. So, when I hear an operator talking about the time of scrub and little about the quality of the scrub, I feel he has failed to teach the subject. Much that is of vital importance fails of accomplishment on account of its very simplicity. I have every encouragement possible which may be brought to my notice to continue my adbominal surgery with gloveless hands.

In twenty years' experience in the Joseph Price Hospital, serving a ten-year apprenticeship under Doctor Price, and during my ten years conduct of that institution, I have seen but one death from appendicitis *per se* (where the abdomen was closed) and that was in a patient with cirrhosis of the liver. The mortality in an operation with greater possibilities of infection, such as suprapubic and vaginal hysterectomy, has remained a fraction of one per cent. May I continue to operate with gloveless hands?

The hand can be surgically cleansed. Will we take time to do it? That is the only question requiring answer. Robert Morris, a skilled operator and brilliant teacher, has done much to point out the errors of the rubber glove, and much that he has said on this subject is of vital importance to the profession. Were I asked if I would advise the profession to discard the rubber glove, I would say no, not by a

great deal. I have often advised a man who was going to assist me to put on the rubber gloves. I knew I could not scrub that particular doctor, and as an assistant it was not necessary for him to have any degree of dexterity. The glove has a very important function in protecting the surgeon and also in helping to keep the operator clean when doing any kind of pus work, when other operations must follow. The glove may be used to its greatest advantage where dexterity and sensitivenss of finger is not profoundly required, such as instrumental bone work, etc. Especially is this true of the operator who just will not scrub.

241 NORTH 18TH STREET.

THE SUBMUCOUS RESECTION OF THE NASAL SEPTUM.

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(*Concluded from the February Number.*)

V. SPECIAL SURGICAL PROCEDURES

In the previous section we have described the surgical procedure to be followed in the more typical cases of septal deviations. But in these cases, as in all operative work, the surgeon often finds unusual conditions which tax his skill and ingenuity. Some of these exceptional cases occur frequently enough in a long experience to establish a procedure that may itself be standardized. We shall describe some of these cases, with suggestions as to ways to meet the special conditions.

There are deviations of the non-descript type which exhibit a well marked spur or ridge. In these cases it will be found that the septum after being thrown out of the normal position has bowed, so that it is convex on one side, and more or less concave on the other. These spurs commonly have at their extremities well-defined crests. On the concave side, toward the anterior part of the nose, there is more or less of a gutter, the depression becoming more marked in the posterior region. This ridge and depression are found to extend back in most cases over about two-thirds of the length of the septum.

In special cases of this ridge and depression type, the incision is made at the usual position, as described in Section IV. If the concavity of the septum occurs on the left side, the mucoperichondrium is first separated from the crest very carefully with a small knife of the Ballenger type. The original incision is then prolonged to the outer side of the nose near to and a little forward of the lower tip of the inferior turbinate, as in the regular procedure. The flap will then lie at an acute angle, leaving abundant space, a very necessary requirement in these cases calling for extra caution. The loosening of the membrane should be done with great care, using the curette end of the elevator, as illustrated in figure 16, and separating very gently with an outward motion from the gutter, at the same time keeping the curette in the groove. The greatest caution will be found necessary at the point of deepest depression, usually opposite the sharpest point of the spur and in a posterior position on the septum.

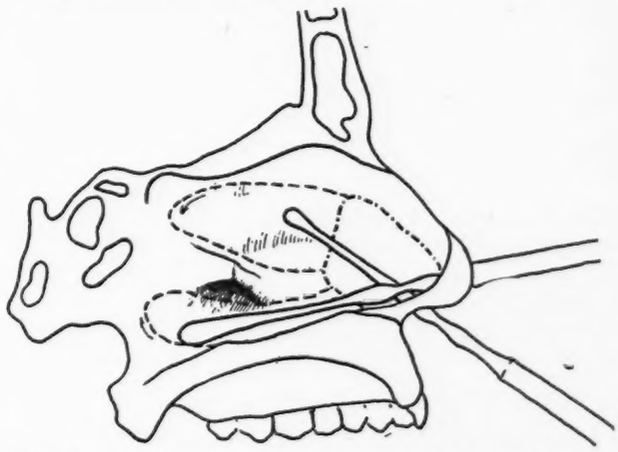

Fig. A-1. Diagrammatic drawing showing positions of Dunning's curette elevator in loosening membrane above and below spur.

Such is the procedure when the ridge lies on the left side. In dealing with cases presenting a well-defined groove on the right side, remove with the curette a part of the cartilage just behind the original incision, separate on the concave side, and proceed as before. It is a matter of observation that these spurs are found on the right side in the greater number of cases, and if we recall that they are traumatic in origin the reason is evident because of the ordinary incidence of blows from a human source.

After the removal of the anterior portion of the cartilage, it is well to continue the separation higher up with the curette end of the elevator. There is less danger of tearing the membrane with this instrument. (See figure A-1, first position.) Then changing to the other end of the elevator, continue the separation by pushing gently upwards and backwards. There will usually be little difficulty in separating the membrane down to the point on the spur where the convexity is causing tension with consequent thinness of the membrane. (See second position, figure A-1.)

In the majority of these cases with the spur and ridge, posterior to the sharpest point of the deviation the septum after a gentle curve falls back to the perpendicular. In such noses, smell may be fairly normal except from some secondary difficulty, but breathing is apt to be seriously interfered with. This is because usually the bone behind the spur was not affected by the original injury. But in cases where

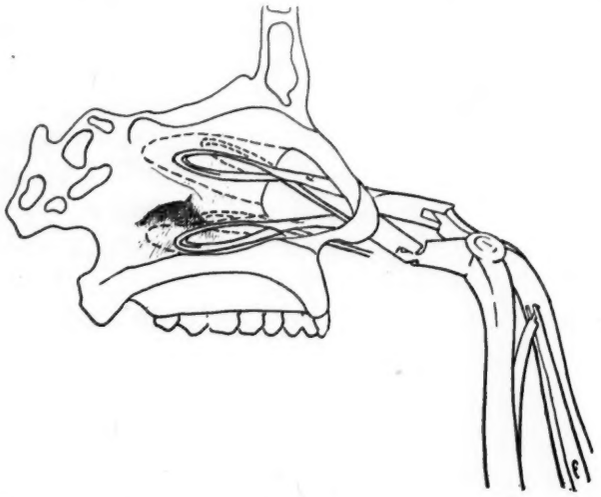

Fig. A-2. Showing Jansen-Middleton forceps biting away cartilage and bone above and below spur.

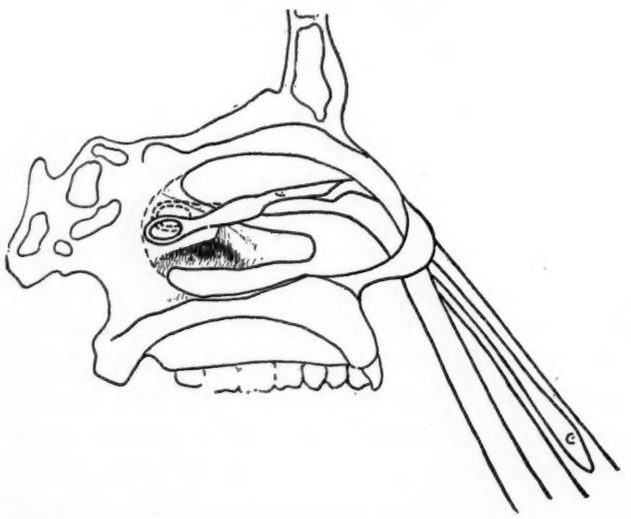

Fig. A-3. Showing punch forceps biting away bone and cartilage back of spur.

the bone is affected, the cartilage and bone high up and near the spur may be removed by inserting the Jansen-Middleton forceps and biting them away, as illustrated in figure A-2. This procedure will relieve the situation above the spur. Then take the forceps, go in back of the spur and press down gently. This gentle downward pressure will separate the membranes, which are usually loosely adherent posterior to the spur. This will also break down the posterior attachments of the spur, which as a rule extends from a position near the floor in the anterior part of the nose upwards and backwards for a distance nearly half the length of the septum. The situation has so far been relieved back of the spur. We now start in front of the spur and near the floor of the nose to separate up to where the mucous membrane thins again. Bite through at that point with the forceps. (figure A-3.) By this time the spur is so completely loosened that a gentle push with the curette will cause it to separate from the membrane, when it can

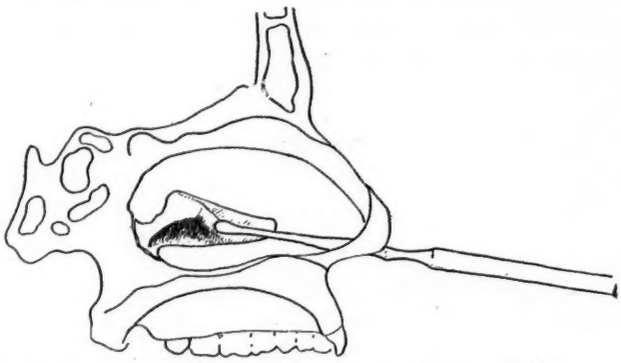

Fig. A-4. Showing removal of spur with curette.

be removed from the nose without difficulty. (figure A-4.)

Another case calling for variation from the usual procedure, and almost as common as the spur and

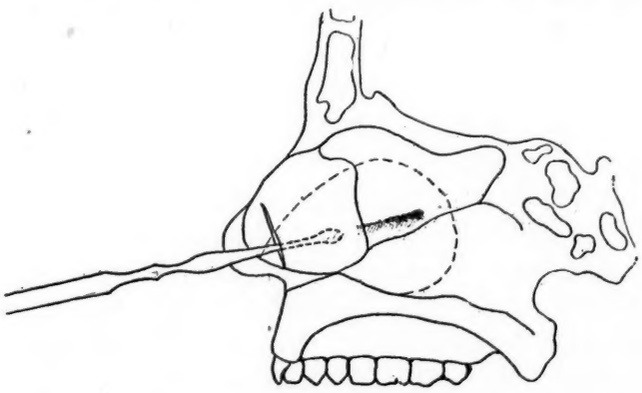

Fig. 16. Showing curette loosening membrane along groove.

groove, is a result of the breaking, or more correctly, the smashing of the septum, with both bone and cartilage involved. As a result of this injury there has been a formation of fibrous tissue with adhesion of the membranes on both sides of the septum. To deal with these cases, open up the incision in the usual way. Use a curette to gain space. It will usually be found advisable to continue the use of the curette until the line of cleavage has been located. After this point has been reached the usual procedure applies, except that it may be necessary at times to use a knife in loosening the adhesion.

We have already alluded to a type of deviation in which the deflection is almost at right angles to the

perpendicular line, with a cul-de-sac formed by dislocation in a posterior position. The formation of fibrous tissue which has resulted completely separates the two severed portions of the septum and unites the muco-perichondrial surfaces. In such a case, make the usual incision and separate the membranes on both sides up as far as the cul-de-sac. Then with the curette or forceps remove all the cartilage except the ridge above. (figure 17.) Working high in the nose, separate the membranes behind the cul-de-sac and on the concave side. They are usually not so adherent in this region. Then curette through on a line a short distance posterior to the sharp angle, removing the cartilage but leaving the ridge. After this stage is reached, the procedure becomes

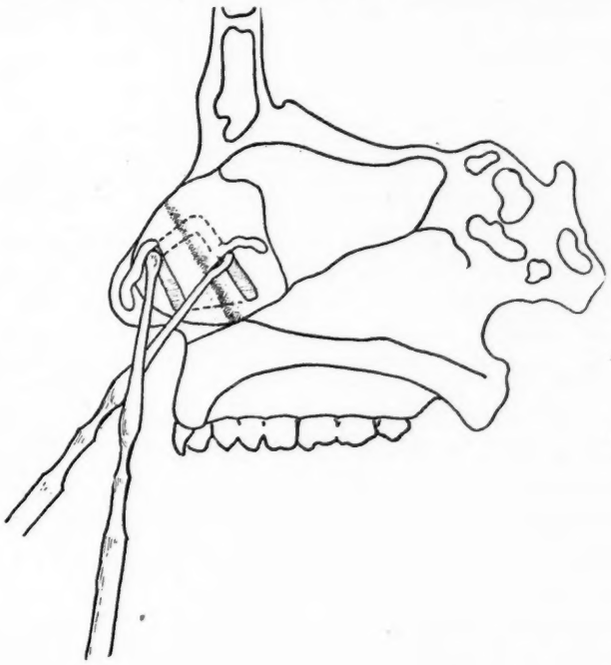

Fig. 17. Diagram showing curette scooping out cartilage on both sides of cul-de-sac.

the usual one. It is to be noted that in this case there are two curettes through the cartilage, one anterior, the other posterior. When this has been done and the adherent membranes loosened, hook the cartilage at the high point and bring downward and forward with a sweeping motion toward the opposite side, thus removing the obstruction. (figure 18.)

Inasmuch as it sometimes happens to the most careful operator that he punctures or tears the opposite membranes, it is well to know how to remedy them. The following procedure devised by the writer gives excellent results in a large number of cases: Drive a needle, preferably of the style of Yankauer's curved suture needle threaded with silkworm gut, well into the tissue anterior to the incision and low down near the floor of the nose. Then push the needle upwards and backwards so that it will cross the line of the incision as high as necessary in the nose. After the needle is in position, holding the gut with angular forceps withdraw the needle. If the perforation is small, it is unnecessary to reach as high on the membrane. But if the perforation is large then separate the mucous membrane as high as

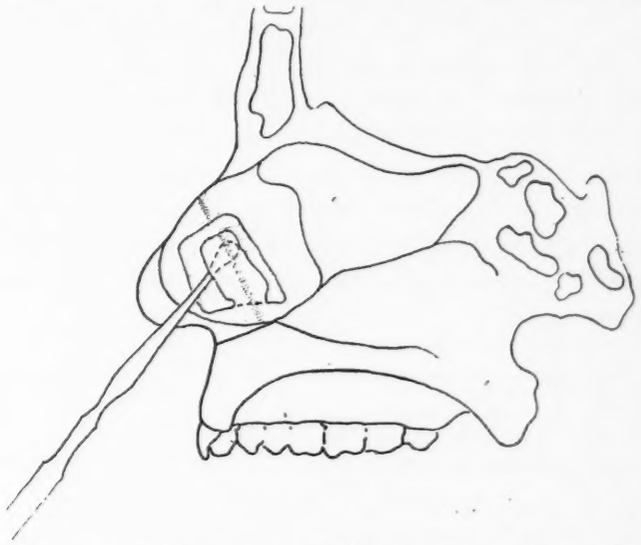

Fig. 18. Showing curette hooking cartilage at high point and removing obstruction, after clearing away cartilage about the base to facilitate breaking.

the bridge of the nose, cutting with a knife from the side on which the flap is being made, as illustrated in figure 6. The membrane having been loosened enough to allow the flap to fall into position (see figure 19) the suture is drawn with a running loop

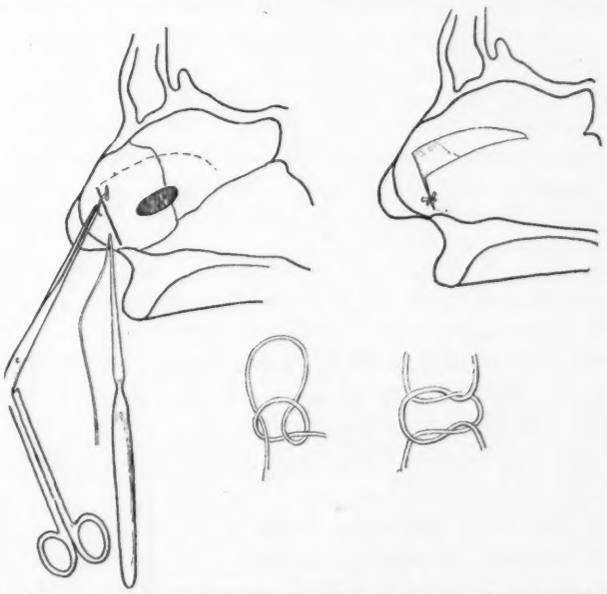

Fig. 19. Diagrammatic drawings of procedure in closing perforation, showing position of needle and angular forceps; also suture, together with knot used in tying silkworm gut.

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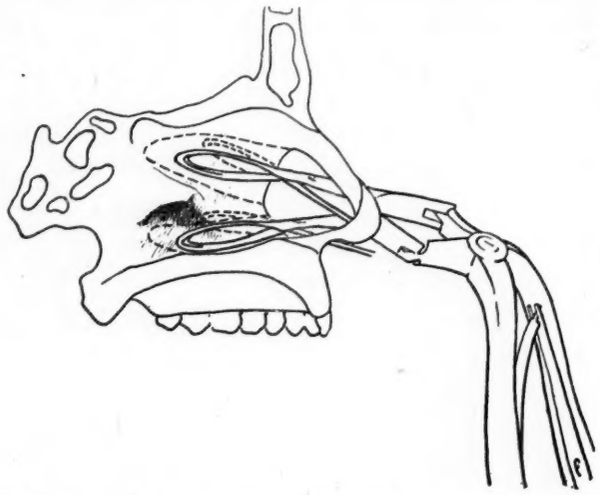

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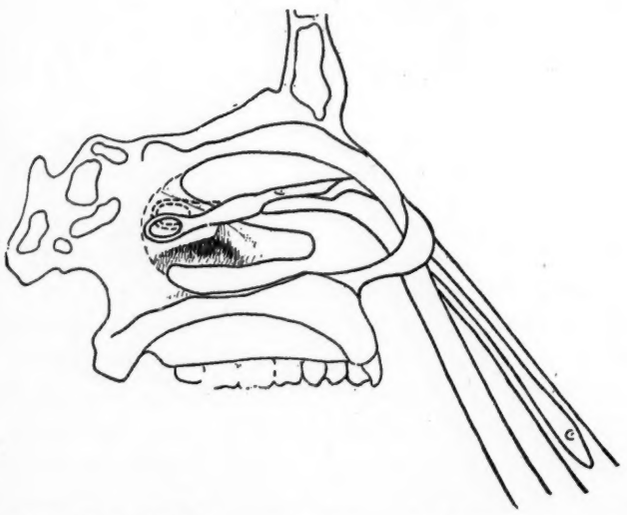

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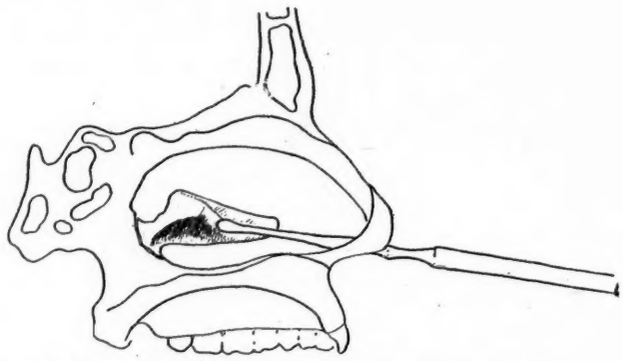

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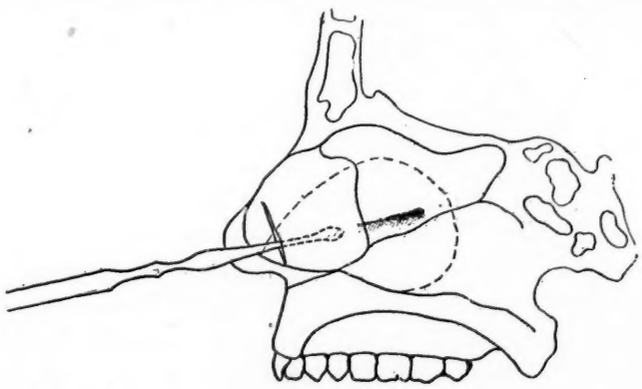

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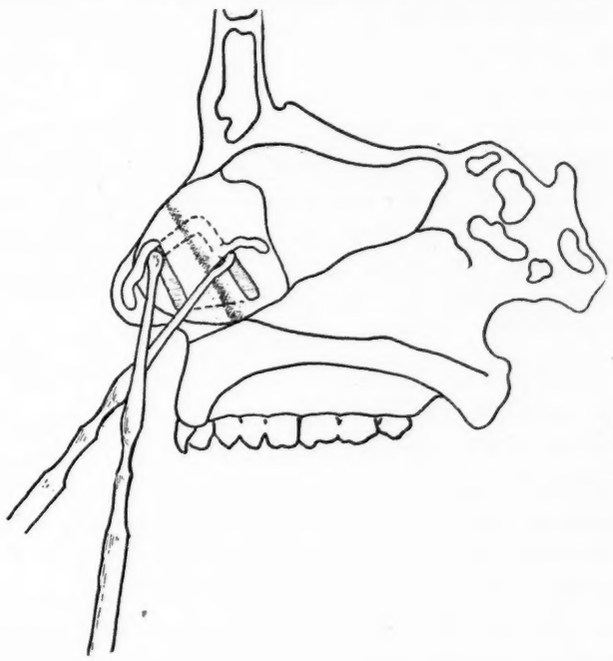

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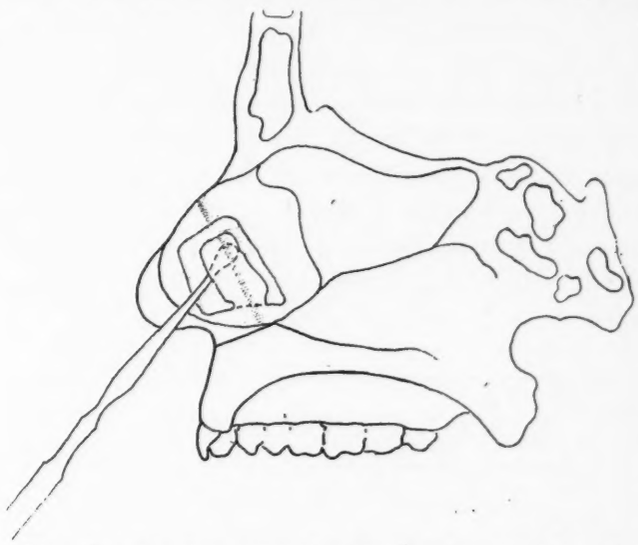

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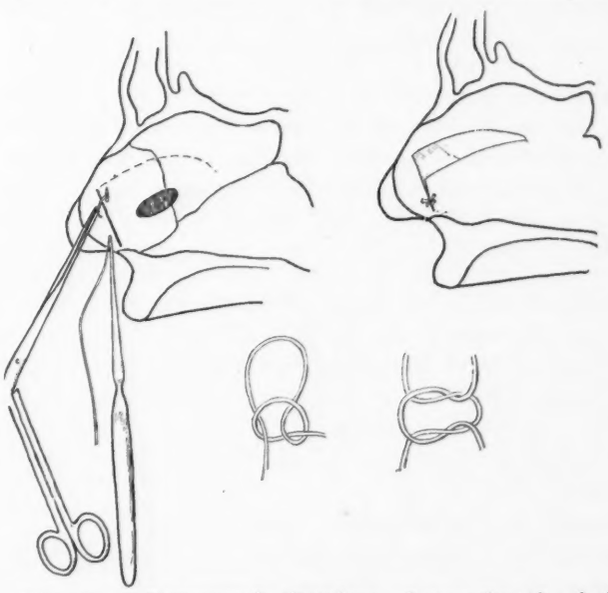

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(figure 19) and afterwards tied with a surgical knot. On account of the free circulation of blood in the septum there is practically no danger of a necrotic flap. Pack the nose lightly and not too far posterior,

to avoid ear difficulty, using vaseline gauze. In 24 hours the gauze may be removed on the opposite side; in 48 hours on the side on which the perforation has been repaired. The suture is left in position several days, until it begins to cut itself out.

It is in these special cases that the operator on the septum finds his greatest difficulties, just because they confront him with unexpected conditions. But patience and skill and a cool head combine with the knowledge of the experience of others to simplify the problem. As these special cases give the greatest difficulty to the patient also and call most insistently for correction, the writer feels justified in the attempt to describe a procedure which calls more urgently for a skillful hand than for language, and which is therefore hard to translate from action to words.

Communications

EXTERNAL ALVEOLECTOMY

209 Post Street,
San Francisco, February 8, 1921.

Editor, AMERICAN JOURNAL OF SURGERY,

In the *Journal of the National Dental Association,* June, 1920 appeared an article on "External Alveolectomy" for the removal of dead teeth and their pathologic products by William Lete Shearer, M.D., D.D.S.

Dr. Shearer summarizes the operation that he describes as follows: A. Novocain nerve block anesthesia; B. The teeth are removed, the mucoperiosteum is reflected up to the root ends of the tooth sockets, the external alveolar plate of bone is taken off, the diseased tissue is attended to under the eye; C. The bone is smoothed, leaving no jagged edges, the lingual, buccal, gingival mucosa trimmed and sutured with horse-hair; D. The sutures are removed in from four to five days.

In all essentials this operation is precisely the same as that which I have been describing and advocating ever since early in the year 1915 in:

Pacific Dental Gazette, March, 1915, May, 1915.

Transactions of the Panama-Pacific Dental Congress, August, September, 1915.

California State Journal of Medicine, November, 1915.

Pacific Dental Gazette, February, 1917.

AMERICAN JOURNAL OF SURGERY, August and September, 1917.

Journal of the California State Dental Association, November and December, 1917.

AMERICAN JOURNAL OF SURGERY, March, 1918.

New York Medical Journal, March 1918.

The Journal of the National Dental Association, June, 1918.

Journal of the California State Dental Association, June 1918.

AMERICAN JOURNAL OF SURGERY, February, 1919.

Medical Review of Reviews, February, 1919.

The Dental Summary, June, 1919, July, 1919.

The Journal of the California State Dental Association, July, 1919.

California State Journal of Medicine, September, 1919.

The Southern Medical Journal, September, 1919.

Illinois Medical Journal, August, 1920.

Sincerely,
Josef Novitzky, D.D.S.

THE RELAXED EAR DRUM.

It is the universal opinion that so-called catarrhal deafness, better termed progressive deafness, is caused by a stenosed Eustachian tube with retraction of the ear drum due to insufficient air pressure. But if one examined carefully he would be surprised to find that in a number of cases the tube is patulous, in fact wider open than it ought to be and that instead of the ear-drum being retracted, it is relaxed. In such cases the deafness is due to a relaxed ear-drum which is unable to convey the sounds to the auditory nerve. —HAROLD HAYS in *The Medical Times.*

THE TOLL OF AMERICAN NURSES IN THE WAR.

A sacred constellation of one hundred and eighty-four gold stars on the service flag of the American Red Cross Department of Nursing at Washington is the silent token of the supreme sacrifice made by that number of American nurses. The record is still incomplete and when this roll of honor is finally closed it is probable that the names of fully two hundred American women who have laid their lives on the altar of freedom will have been inscribed upon it.

Death came to American nurses in many forms. Striving against almost hopeless odds to check the epidemic of influenza that swept over the training camps in this country in 1918 nearly a hundred nurses themselves succumbed to the scourge. Many more were victims of the disease when it raged in the war zone. Ministering to the wounded in France other American nurses were killed by Hun ruthlessness in airplane raids.

But the American nurse who gave her life to the cause of Liberty did not die in vain. Into the shadowy beyond there went with her the prayers and murmurs of gratitude of those she succored. High military leaders gave their word of praise and appreciation for faithfulness that never faltered, while in homes saddened by the loss of the loved one there is imperishable pride.—*American Red Cross.*

American Journal of Surgery

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WALTER M. BRICKNER, M. D., F. A. C. S., Editor.
New York City

ELMIRA, NEW YORK, MARCH, 1921.

ACUTE ANATOMY

On the programme of a medical society in New York we find the printed title: "Paper—The Acute Pelvis". This is not surprising. If we can accustom ourselves to "acute abdomen" and "chronic appendix," why not also this delightfully descriptive expression! If another abortion of English is to be born into medical terminology, wherefrom better than the pelvis!

One of America's most renowned surgeons recently delivered an address describing certain experimental investigations that he had conducted, and their bearing on abdominal surgery. In the first two paragraphs of that address, just printed in a medical journal, this distinguished and brilliant surgeon speaks of "an interval appendix"...."an acute appendix,"...."acute and chronic suppurating gall-bladder".

Where is this to end? Otologists, emulating the noble example, talk of "chronic ears", and now gynecologists, not to be outdone in picturesqueness, have invented "the acute pelvis". May we not expect dentists to swing into line with "chronic teeth" and chiropodists with "acute toe-nails"?

A much revised medical dictionary will soon be needed, and we may expect to find in it definitions such as these:

Eye, Chronic. One that has lost its acuteness of vision.

Exploratory. Exploratory operation. (*Operation* is omitted for brevity only—never otherwise) Noun. May be singular (often very) or pleural.

Intestine, Chronic. That portion of the digestive pathology that extends from the duodenitis to the fistula in ano, and produces cramps, temperature, diarrhea, catgut, and exploratories.

Lung, Acute. A pulmonary disease formerly called *pneumonia* (obsolete).

Operation, acute. One performed upon an acute abdomen (*q.v.*), usually after midnight.

Pathology. The disease removed from an organ at operation and located elsewhere at post-mortem. Formerly used to mean: The doctrine or consideration of diseases and of deviations from normal structure.

Post-mortem. Formerly an adjective, now a noun. See *autopsy*.

Temperature. Synonymous with *fever, pyrexia.*

Tongue, chronic. One that talks loosely; the antonym of *native tongue.*

Urethra, chronic. That portion of disease which forms a communication between the vesiculitis and the outer world, and gives passage to shreds, sounds and semen.

Wasserman (occasionally spelled **Wassermann**), **Babinski, von Graefe, Romberg.** Once distinguished physicians and investigators, now reactions and signs that indicate various pathologies.

X-Ray. Once used to designate the peculiar light rays discovered by Roentgen. Modern medical writers use the term to mean an *x-ray picture* or an *x-ray examination,* e.g., "an *x*-ray of the stomach showed marked pathology".

Shades of Oliver Wendell Holmes and Weir Mitchell, be not distressed. This new tribe of medical writers is not assaulting the language of "Elsie Venner", of "Hugh Wynne". They are inventing a new language of their own.

HOW TO PREPARE A MEDICAL ARTICLE

Even with such a dictionary as we have above referred to, we fear the novice may feel that he is insufficiently equipped to write an article in this modern and popular style; and so we are publishing here a complete form that he may follow with entire confidence. It will be necessary to change only the dates, figures and a few other facts, to suit the author's needs or taste; but if he choose to vary it still more, the introductory instructions and explanatory notes will guide him in the right path.

If you feel the urge—or the need—to write a medical article, *don't—don't restrain yourself* merely because you have nothing new to say and hardly know how to say it! Facts and theories in medicine must be repeated again and again to drive them home. Remember that not all your colleagues read the same text-books that you do, and therefore it is your duty to disseminate their information. If, at the eleventh hour, you have hastily scratched off a "pot-boiler" as your contribution to a "symposium", don't waste it on the limited audience of a medical society—publish it!

If your contribution needs no illustrations, send some anyhow. If two or three are necessary send

six. Be liberal. It's a good idea to have these pictures *very* large—so large that the editor will print your article promptly to get them out of his way. Playfully enclose with these handsome wash drawings showing the skin incision about to be made, the skin incision half made and the skin incision completed, two or three very small, loose vest-pocket-camera photos. This is to test the editor's care of valuable property. Of course, he will not have any illustrations on hand but yours, therefore don't bother to write your name on them. If a weak *x*-ray print of the intestines battling with barium looks like an eruption of Vesuvius, held one way, and a military map, held another way, don't indicate which pleases you the more. Let the editor choose between top and bottom and then you may kick because he guessed wrong. You will recognize, if you stop to think about it (which you don't), that the legends for your illustrations must go to the printer to be set in type, while the pictures themselves go to the cut-maker to be reproduced. Therefore, *don't write these legends at the end of your article, where they belong, but paste each one tightly on the picture to which it refers.* This is to exercise the editor's ingenuity in removing them or his secretary's patience in copying them; and it is sure to make him think more of you. If you want the illustrations returned to you, don't say so, with your name and address on the back of each; let the publisher guess it by omitting to enclose return postage. If you make a sketch to illustrate what you are talking about, draw it right on your manuscript just where you want it to appear. The printer would not know what to do with it, but the editor can cut it out—in one way or another.

If possible, make up some charts or statistical tables on a dozen large sheets pasted edge to edge. To print them across a single page or even two pages, will be an interesting puzzle for which both editor and printer will be grateful; the tables are desirable to show the thoroughness of your research (into the literature), and their reproduction is no worry of yours. In these charts try to avoid any uniformity in typography, titles, abbreviations, capitalizations; write "minus" in one column and (—) in another, "percent." in one and (%) in another; and then make the spaces so small that the editor will not be able to take any liberties with them. Put in your manuscript "Insert Table 1 here". How can you foresee that the "here" will be an inch and a quarter from the bottom of the printed page?

Be sure to have your article written on a typewriter with broken characters and a much-worn ribbon. If the letters are clear and even, the editor will think that the machine is fairly new and he will jump to the conclusion that you are only a beginner. It will please him if the ink is a very pale blue or a vivid purple; the compositors also have a curious fondness for those tints. If your typewriter has a two-colored ribbon, you will not need to underscore headings and emphasized words; just write them in red ink. The printer, seeing red, will know exactly what is to appear in that color.

If you make copies of the article, keep the clearest one to read at the society meeting and send a blurred carbon copy to the journal. The purpose of that is to oblige the editor to read it slowly, which will the better impress him with its worth. Don't waste time reading over this carbon copy to supply omitted words or correct misspellings; let George editor do that. Use very thin, transparent sheets. This is not to save yourself postage but because, when the editor finds that the paper tears under his pencil, it will discourage him from making any unnecessary changes in your composition. For the same reason, never double-space your manuscript or leave a margin on either side. It is unimportant whether or not your pages are numbered after the sixtieth.

Avoid short sentences. Copy the style of the fourteen-line introductory sentences in newspaper articles, which begin with "The man whom the police suspect" and end near the middle of the column with "sailed yesterday on the Aquitania". In learning to write impressively involved sentences, forget the old rules that require subject, predicate and object. Indeed, it is best to ignore most of the rules of grammar, rhetoric and composition. Don't fetter your style. Get your thoughts across. Write, as you talk, free and easy, and thus convey to your readers the impression of spontaneity and sincerity. Don't waste thought on punctuation or paragraphing; at any rate, carefully avoid the appearance of having bothered with any uniformity in such trifling matters. Abbreviate words frequently, especially those in common medical usage; this gives the needed stamp of easy familiarity with the subjects and, too, abbreviations always look well in print. Do not, however, abbreviate the same word all the time or always in the same way; you must do nothing that would appear to be by system . Capitalize words here and there indifferently; this will make an ornamental relief to typographic monotony and attract the eye of the casual reader.

If you use headings and sub-headings underscore them for CAPITALS and for *italics* indiscriminately. This may annoy a too precise editor but, if it gets by him, it will show your readers that you have individuality. Similarly, if you use letters and numbers to indicate divisions and subdivisions, mix them up freely; make it evident that you are above trifles.

Spelling is entirely a matter of individual preference; let the editor see that you have ideas of your own. Spell proper names as they sound to you; the way their owners' spell them is their affair, not yours.

Don't refer to yourself as "I"—at least, not systematically; it fastens your responsibility too clearly. Call yourself "the writer" and "the author"; that makes one wonder whether you mean yourself or someone else you have just quoted, and it is important that you give your readers something to think about. "We" and "our" are also good substitutes for the immodest "I" and "my"; thus, when you say "at the hospital it is our routine...." you artfully suggest, without asserting, that the rest of the staff is as guilty as you are. The rules have not yet been sharply

defined in the new system, however, and the best practice at present is to say "the writer" and "the author" most of the time, sprinkling in here and there a few "I"s and editorial "We"s.

There are certain words and expressions that belong in every medical article. Be sure to use them. These are: "cito, tuto et jucunde", "fons et origo", "pari passu", "marked", "throws light", "presented", "examination revealed", "symptom-complex", "interesting and instructive", "significant observation", "points out", "unexplored fields". (There is room in almost every article to scatter a few small "fields") When reporting a case refer frequently to "patient," but never write "the patient died"; say "ceased" or "exitus lethalis". On the other hand, don't be pedantic—if you want to come into this school of modernized medical English. You must not write "fenestra" (plural, "fenestrae"), but "fenestrum" (plural, "fenestra"); you are not in Rome so you don't have to say what the Romans would have said. Therefore also say "this data", instead of "these data". Say: "nauseous" when you mean "nauseated"; "looked like he was going" instead of "looked as though he were going"; and "since two years" rather than "since two years ago". If you are describing a case seen in 1910 nevertheless say "for the past two years" instead of "for the two years preceding". Use "that" and "which" alternately, "will" and "shall" indiscriminately. Say "same", when you mean "it"; the effect is more pleasing.

Embellish your article with references. If you wish, you may add to it a bibliography taken from a recent paper on the same subject. If that is not convenient you may, on the other hand, simply append the names of a few text-books without indicating what parts of them are concerned. Either way is acceptable, under the rules. If you quote or refer to a few publications, gather these titles at the end of the manuscript and label them sententiously "bibliography", not merely "references". Don't bother to read these publications in the original, nor to verify the accuracy of the references themselves, or of their dates, or of the authors' names. Especially avoid any uniformity in arranging these titles. Abbreviate the names of journals in as many different ways as you can. Give only the volume number, not the date; the reader can discover in a library what year the article was published. References to articles in weekly journals, however, should be simply by the year and the page number; anyone that wants to, can find out for himself whether it was in the first or second volume of that year. Don't spend ten cents to buy the little pamphlet on *The Bibliographic Style of the Journal of the A. M. A.;* you might be tempted to follow its scheme of abbreviations of journal titles. Establish your own style, or, better yet, avoid all style.

Select the title of your paper with great care. You might head it *Diptheria* (one *h* is quite enough for this word and for *opthalmoscope*) or *The Chronic Abdomen,* but such titles are too precise. Don't let your audience know too soon what you are talking about; exercise reserve, keep 'em in suspense. It is better, therefore, to decide on such a title as *An Interesting Case;* that will defy classification in the *Index Medicus* and give you security in the feeling that you will not be quoted too widely. If, in the course of your paper, you mean to describe a new sign, reaction or apparatus, don't mention it in the title or as a subtitle, for then, too, it would be indexed, and you might be embarrassed soon to find it referred to by others —a liberty which, of course, you resent.

Your name should be followed by your collegiate degrees, also by your various hospital titles and medical society affiliations. It is a good idea to omit the least important of each of these and write in its place: *etc.* Since your name belongs under the title on the first page of your manuscript, write it modestly on the last page. When the editor discovers who it was that favored him with so interesting and instructive a contribution, he will not mind the slight effort of transposing your name and identifying labels. Don't, however, leave a space as though you expected him to do this; it will be just as easy for him to paste an extension on your first sheet. You will wish to tell, in a foot-note, where your paper first saw the light of night, for example, **Read at the first Annual meeting of the Alumni Association of the Montgomery Worthington Sniffem Memorial Hospital for Umbilical Deformities and Diseases of the Sternum, Sniffemtown, Pennsylkota, Apr.* 1-'20. This, too, belongs on your first page, but you may put it on the last as though it were a trifling after-thought.

Having mastered all these new, but simple, rules you are now ready to put the subjoined *model* and two text-books on the desk before you and proceed with your composition. But here we must detain you for a final word of advice. Don't make the mistake of merely saying what you have to say, stripped of all inconsequential details and unnecessary verbiage. Don't write tersely, concisely, and strictly to the point; that would be crude and brusque, and your article would be scorned as too brief to be worth reading. Your facts should not be thus nakedly exposed; they must be protected, surrounded, embellished, buttressed and supported. Don't start off abruptly, and don't stop when you have said all that you need to say. Lead up to your subject very gradually, insidiously. A very good and quite original introduction is the historical retrospect, with just a suggestion (here be cautious) of prophecy. This supplies an approach from a broad background, and incidentally displays your acquaintance with the history of your art. Thus:

In the proud Annals of Medical history—or, *Among Medicina's great accomplishments in the alleviation of suffering, the triumphs of Abdominal Surgery stand forth* [or you may say *stand first*] *as a brilliant page of human endeavor. The introduction of Antisepsis and then of Asepsis revolutionized surgery and made it possible for the eager surgeon boldly to go into the abdomen and searching its depths, and feel confident of early discharge from the hospital. In those early days....* [here give a pen picture

of Ephraim MacDowell operating upon Mrs. Crawford in the wilderness of Kentucky or, if you do not wish to go back quite so far, say] *when Willard Parker drained the appendix abscess by simple incision, appendicitis as such was not recognized.* Then refer to Reginald Fitz and McBurney, Murphy, Fowler, etc., leading your hearers step by step to the climax: *and today the pathology and treatment of acute appendix is a finished chapter—a field of purely surgical activity which even our medical confraires no longer dispute. But the Surgeon did not stop with the conquest of the right lower quadrant, intestinal pathology has also yielded to his technical research and today the more difficult field of the upper abdomen is no longer a noli me tangere to the expert surgeon, the pancreas, the stomach, duodenum, spleen and gall-bladder are also yielding to his knife. Pari passu with the development of abdominal technique the laboratory and the x-ray have advanced so that with their aid the surgeon now approaches cases with a large % of positive diagnosis. Look back thirty years to the beginnings of modern appendix work and when you think of all that is being accomplished it will not be long before the surgeon will be able to recognize and classify the fons et origo of all abdominal pathologies and promptly to remove them cito, tuto et jucunde. But we are still some distance from that distant goal. In spite of the wonderful advances in this field of medicine there remains several unexplored fields in which we have only made a beginning. It is not possible for me to consider them all within the limits of this paper and I will only call your attention to one field upon, which much light is needed to be thrown. I refer to those obscure and baffling cases of right-sided pathology in which pains persist even after the removal of a chronic appendix. Here is a field that invites the combined and earnest study of the Internist, the Surgeon, the Pathologist, the serologist and the X-Ray man.* ["X-ray man", "eye man", "ear man"—like "old-clothes man"—give a pleasing touch of friendly familiarity.]

It is now time for a couple of references: *Gehlsteiner, as quoted by Boedleston and Woerz (Ganzgebluet fur Augenheilkunde und Margenkrankheiten, CXLI, 606) says* [don't bother to verify what Gehlsteiner said, nor even what Boedleston and Woerz said he said; you can get facts enough for your purpose from a garbled abstract that says Boedleston and Woerz said Gehlsteiner said:] *he observed in four fatal cases of right-sided pathology that no symptoms returned after removing gallbladders which were apparently normal grossly upon exploratory. Smith (Journal of Experimental Mortality, 5-'19) reports a brilliant series of experimental observations upon the variations in the respiratory rates of guinea-pigs deprived of cabbage leaves, and he points out that an increase in the metabolism rate above 6.3% reduces the H-ion concentration in the tissues, which causes a reduction in the CO2 tension in the blood, followed by a measurable increase in its cholesterin content. He also made the significant observation that in such guinea-pigs the bile can be made to precipitate by the passage through it of a weak galvanic current, after boiling for five minutes. The writer believes that this may have a bearing on gall-bladder pathologies.*

Now you are ready for your case:

The following case is presented, not because it is of any significance but because it was my first operation in private practice. Cross that out and begin over again: *The following case is presented not because it is conclusive in itself but in the hope that it will arouse discussion which will throw further light on this obscure field. On Feb. 9-1920 the writer was called in consultation* [not necessary to underscore "in consultation"] *to see....*or *On Feby 9" '20 this case presented himself at my office,* [Formerly a case was a condition, not an individual; but this is changed in the new medical dictionary. Remember, patients do not come to a doctor's office, they "present themselves"—often that is all they do present] *with the following history—*

Mr. A. J., male, a young man of 21. Occupation:—plumber. [In this line you drive home the sex of the individual so clearly that very little doubt remains. If you merely said the patient was "a man of 21" instead of "a young man of 21" there might linger in the minds of some of your audience the suspicion that his symptoms may have been due to senile changes; and if you had written simply "plumber", instead of "occupation, plumber" it might be thought that plumbing was merely his week-end diversion and not a life passion.]

FAM. HISTORY—Father died in infancy, mother died in Ireland. 1 b. and 1 s. a. and w. Paternal aunt has epilepsy, hemiplegia, incontinence of urine and club-feet but is otherwise well. Maternal Grandmother living and well. She began to menstruate at 14, always regular, etc., etc.

Previous Hist.: Had mumps, measles and malaria. Habits,—good, never drank before July 1919. Being a plumber he got very little muscular exercise. Denies G., S., and several other letters.

Now *you* know that the above details have no bearing on your case but your readers don't know it—yet, so give it all to them "for discussion".

PRESENT HISTY;*Since three years patient has had pains on right side of his abdomen coming at intervals of few days to several weeks and lasting a few minutes up to several hours. No relation to meals.* [The patient and his grandmother dine together alone.] *No vomiting but often is nauseous and feels like he is going to vomit. Pains sometimes in rt. illiac region, sometimes they run around to right kidney, sometimes they come around his naval or are refered to the R.U.Q. Two and a half yrs. ago he was operated upon for an interval appendix and felt well after that for a few weeks. Then the pains recurred again. Never jaundiced. Appetite good; always very constipated. Takes physics a good deal. No urinary or pulmonary sympts.*

Status Praesens—He had no temperature, pulse 78, r. 24. Physical Examination revealed:—Here set down in great detail the report of your complete ex-

amination from scalp to toes, with proper phraseology, such as "percussion elicited" and "rectal showed", including

Abdomen—On inspection the abdomen was not distended. A four-inch scar is revealed over the McBurney. On palpation there was no rigidity but there is tenderness on pressure in the R.L.Q. In the R.U.Q. deep pressure under the costal arch elicited marked tenderness. Liver edge not felt.

The urine showed: clear, ac., amber, sp. gr, 1020, *no alb., no sugar, micr. negative. Blood examinations shows*—4,560,000 *r. b. c.*
7,200 *w. b c.*
polys 68%,
etc.

I diagnosed a right-sided pathology, nature to be determined, and advised patient's removal to the Montgomery Worthington Sniffem Memorial for further observation and study.

On Admission 2-10-20 *patient had no temperature and no pain, but his expression was anxious, pulse* 96. Here repeat a complete physical examination, including mention of such reflexes, etc., as were not tested "when the case presented himself", e. g.,

He had no Stelwag or Brudjinsky,
No Kernig, Gordon or Bebinsky

Culture from the tonsils showed pure culture ["culture showed culture" and "functional tests of kidney function" may sound a bit awkward to you, but that is the way to write according to the new rules] *of strept. Virodans. Vaccines were made to treat this focal infection. Wasserman negative. Spinal Wasserman-neg. Globulin, cell content and Colloidal gold normal.*

Test Meal showed....put these figures in company front, the blood count figures having been tabulated in column formation.

Ewald showed .....
Rehfuss .....

G. I. X-Rays—Here describe the shape and outline of the stomach, its peristalsis, the picture after one hour, after six hours, after twenty-four hours; and send a full set of these roentgenograms to the journal publisher, to prove to your readers that they "revealed no definite abnormality" in the "G. I. tract"
G-U. X-Rays: Negative.

Insert here another urinary report, and another blood examination record, adding

blood cholesterin 0.2%

No further signs were elicited on repeated thorough physicals but patient complained of feeling sore all over his abdomen. I decided to do an exploratory and remove whatever pathology presented. [Use that last sentence without any change; it's a gem.]

Operation, 2-13-20, *G-O and ether. I made a long right rectus incision*.....Describe in detail: your audience will be as much interested in how you got into the belly as in how you escaped from it. *On opening the peritoneum there was revealed adhesion of the omentum to the abdominal wall and to the caput colli. This pathology was dealt with by separating the omentum. Intestines looked normal and in their proper place. Spleen normal to palpation. Stomach, pyloris and duodenum found in the upper abdomen, and negative to inspection and palpation. Liver of normal size and color. The gall-bladder presented from beneath edge of liver. Its surface was glistening and of normal color. No stones felt in g.b. or ducts. Gallbladder partly filled with fluid. The appendix having been already removed and no ulcer found in stomach or duodenum I decided the pathology was in the gall-bladder and that the proper proceedure* [improved spelling, to be noted also in several other common and medical words used in this model] *was to do an ectomy.* Here describe in detail the removal of the gall-bladder. *A tube drain with two fenestra was inserted. Abdominal wall closed with layer sutures of chrom. gut, Silk-wormgut in skin Sterile dressing applied. Pat. put to bed.* [You want no misgiving in the mind of any critic that after a laparotomy at the Montgomery W. S.M. Hospital you allow a patient to walk to bed and with wound uncovered.] *Time of operation 2 hours, fifty minutes.* [Let no one think you sacrifice thoroughness to heedless speed.] *Patient was in some shock, for which we gave him strych. sulph one-thirtieth and Adrenalene M.X. After two hours I had to open him up again to tie the cystic which the ligature on it had slipped off. Blood Transfusion was also done,* 500 *C.C. Patient vomited persistently for three days and developed Pneumonia at the right base. There was also some troublesome supuration of the wound for the first two weeks, and a paralysis of the right arm from hanging over the edge of the table which did not last long. On the eighth day there was noted a phlebitis in the left saphenus but same is now subsiding. Otherwise patient's convalescence was entirely uneventful.*

Patient's post-operative bloods and urines showed: [Three pages of these will be enough.]

The temperature curve is shown on this chart: Paste it to the manuscript here.

Path. Report of the gallbladder revealed submucous hemorrhages. Since the hospital pathologist is present at the meeting he can describe the findings to you better than we can.

Disch. from Hosp. March 10, 1920.

Since operation patient has had much pain in region of the wound but he is sure same is not the same as his old pains which have not returned again since the gallbladder was taken out. [As you read your report at the meeting the patient, fully clothed, sits beside you in speechless admiration. At this juncture you turn to him with an air that disarms any suspicion of coaching and ask: *Is that right, Mr. Jay?* He slowly nods his head obliquely. Then you say: *Since the case shows only the usual scar I shall not trouble him to undress.* You shake hands with him, express your thanks that he came out on such a stormy night, and dismiss him, without, however, making the fatal mistake of giving him his carfare in the presence of the society. The chairman will not have the temerity to tell you that since you did not show anything on your patient your contribution to

the programme belonged, not at the beginning, under "Demonstration of Patients", but at the end, under "Reports of Cases"]

SUMMARY.

To summerize—A young man of 21 with negative Wasserman and good general health has right-side pains for 3 years, continuing even after removal of an interval appendix. All signs and tests negative except a positive Murphy could be elicited and increase of cholesterinemia 0.02%. On Exploratory no pathology except adherent omentum to caput colli. Cholecistectomy 6 weeks ago and no return of symptoms.

You are wrong if you think that this summary suitably terminates your interesting and instructive contribution. It should be finished off gracefully with "Conclusions"; this will sound very good, indeed, when you read your paper, and it will attract somebody's attention when you publish it. So you continue thus:

Conclusions:—In conclusion would say that

A. Right-sided pains in the abdomen persisting after removal of a chronic appendix is a broad field for further study.

b—That there are probably several pathologies that will have to be considered and worked out.

C, I believe that if we study our cases carefully that Chronic gall-bladders account for some of these cases.

D: Gross normal findings on inspection of gall-bladders at exploratories is not sufficient evidence that they are not the cause.

e in the absence of other pathologies such gall-bladders should be removed.

I wish to thank Dr. Littlefellow for kindly refering this interesting case to me, Dr. Crookstoob, our X-ray man, for his excellent G.I. X-rays, and Dr. O'Topsie, the hospital pathologist for his pain-staking and thorough laboratory work in this case.

Below this write your address (office hours may be omitted), and return the typewriter to its owner; the job is finished, and in a manner that leaves nothing (more) to be desired!

Again we warn you not to re-read your composition; alterations will spoil its freshness. Enclose it at once with a note to the editor of The Medical Speculum suggesting the importance to his readers of publishing it in the next issue. Don't give him a chance to reject it; write a second note a week later asking him when it will appear and expressing your surprise that you have not yet received proofs. If he should return it with thanks for the privilege of having read so interesting and instructive an article and regret that because he has so much material on hand, etc., you can see that he thinks it will make a big hit. Therefore send it to another editor, and another, until you find one who is willing to displace other acceptances to give yours the early publication its importance deserves.

When you receive the proof-sheets, do not read and return them promptly, but put them in your desk for a week; let it be evident that you are a busy man. Meanwhile don't bother to learn the rudiments of proof-reading; that is not at all necessary; just cross out the words you don't recognize as yours and write others over them. The chief purpose in sending proofs to you is to afford you the opportunity to insert in your article a lot of things you learned at the medical meeting. Your paper was probably too short in the first place, so add to it freely; the publishers don't mind large bills for "author's changes" and the editor will have only the warmest feelings towards you for having upset his space calculations.

Order a thousand reprints with covers. When these arrive keep a small pile of them on your office table where no patient can possibly see them, and mail the rest to your friends and enemies in the profession. Let them know you are up and doing even if it is not quite clear what you are up to or doing. It will cost you several dollars, but you'll have the satisfaction of accumulating some handsomely engraved cards of thanks for "your interesting and instructive article on....." (space usually left blank).

Surgical Suggestions

It should be borne in mind that sebaceous cysts of the scalp occasionally undergo cancerous degeneration. It is, therefore, important to remove "wens", and important also to submit all of them, upon removal, to at least a gross examination. If any part of the contents is suspicious, examine it microscopically. If carcinoma is found, the patient should be treated by *x*-rays, or, preferably, radium as soon as the wound is healed.

Be wary of the diagnosis "chronic appendicitis" as an explanation of persistent right-sided pain (even if there is some right iliac tenderness), or of gastric symptoms, unless there has been at least one acute attack! *Most* of such cases are no better after appendicectomy.

An epigastric hernia may be the sole cause of gastric symptoms simulating gastric ulcer, etc. When operating upon the hernia in such cases, however, it is wise to examine the upper abdominal viscera also. Cholelithiasis or a peptic ulcer may be found.

Gastro-enterostomy is often a curative operation in cases of gastric or duodenal ulcer when the pylorus is more or less completely occluded. If the pylorus is quite patent gastro-enterostomy gives no, or only transitory, relief unless the ulcer or the ulcer-bearing segment of the stomach is resected.

Progress in Surgery

Selections from Recent Literature

H. Lyons Hunt, L. R. C. S., Abstract Editor

Squamous-Cell Epithelioma of the Skin. ALBERT COMPTON BRODERS, Rochester, Minn., *Annals of Surgery*, February, 1921.

From a study of 256 squamous-celled epitheliomas of the skin Broders draws many conclusions, among them the following:

The terms "skin cancer" and "cancerous degeneration" should be discontinued.

Cancer is a regenerative-destructive process, resulting in the majority of instances from the interaction of anabolic and katabolic process.

In most cases malignant neoplasia probably follows the chronic excessive destruction of differentiated cells.

As a rule, the more marked the differentiation in a squamous-cell epithelioma, the lower is the degree of malignancy.

Pearly bodies and large flat squamous cells with small nuclei are not cancer. Cancer is regenerative or undifferentiated cells.

In the series studied squamous-cell epithelioma of the skin occured more often in males than in females; in the proportion of 4 to 1. It occured in patients past middle life; their average age was fifty-nine years.

The site of the cancer was preceded by a mole, wart, pimple, scab, ulcer, leukoplakia, crack, wen, blister, or lump in 51.17 per cent. of the cases.

There was a history of injury in 23.82 per cent. of the cases; burns represented 24.59 per cent. of the injuries, and *x*-ray burns represented 20 per cent. of the burns.

Seventy-eight per cent. of all the lesions occurred above the clavicle.

Twenty-eight of the patients were treated with acid, paste or plaster, etc., before they entered the clinic.

Twenty-six per cent. of the patients were operated on before they entered the clinic.

Of the 22.03 per cent. of the cases in which the regional lymph nodes or salivary glands were removed, metastasis was demonstrated in 61.53 per cent. The cervical lymph nodes were involved in 31.25 per cent., submaxillary lymph nodes in 28.12 per cent., the parotid lymph nodes in 25 per cent., the parotid salivary gland in 25 per cent., and the axillary and inguinal lymph nodes each in 15.62 per cent.

Fifty-one per cent. of the patients operated upon and traced are dead. Eighty-two and thirty-five hundredths per cent. of the living patients report having been free from the disease on an average of seven years.

Of the patients operated upon who died, 65.51 per cent. died of epithelioma.

The total poor results were 40 per cent. in patients who were previously treated with pastes, plasters, and so forth; and 30 per cent. in the others.

No patient with cervical lymph nodes or more than one group of any lymph nodes involved has been reported living.

All the patients reported dead who had metastasis died of epithelioma.

Sixty per cent. of the patients operated on in whom no metastasis was demonstrated are living, all with good results, and 40 per cent. are dead; over sixty-six per cent. of the patients reported dead who did not have metastasis died of epithelioma; fifty-four and seventy-six hundredths per cent. of the patients reported dead in whom no regional lymph nodes or salivary glands were removed, died of epithelioma.

The total good results for the patients with metastasis are 6.66 per cent.; for those without metastasis, 77.77 per cent.; and for those in whom no regional lymph nodes or salivary glands were removed, 66.33 per cent.

The average duration of the lesion in the patients with metastasis was two years; in those without metastasis, five years; and in those in whom no regional lymph nodes or salivary glands were removed, four years.

In his study Broders divided the lesions into four grades, according to the proportions of differentiated and indifferentiated epithelium. Those with a large percentage of differentiated epithelium were least malignant and gave the best results; the converse was also true.

The Diagnosis and Treatment of Hydrocephalus Due to Occlusions of the Foramina of Magendie and Luschka. WALTER E. DANDY, Baltimore, *Surgery, Gynecology and Obstetrics*, February, 1921.

Every case of hydrocephalus has a specific cause which can and should be located during life. He cites a group of cases caused by closure of the foramina of Luschka and Magendie. After discussing the anatomy and pathology of the foramina, the treatment of their occlusion and the production of a new foramen of Magendie at operation, Dandy concludes:

1. Blocking of the foramina of Luschka and Magendie invariably produces hydrocephalus. Patency of one of the three foramina prevents the development of hydrocephalus, provided the subarachnoid space is normal.

2. A group of cases is presented with occlusion of these foramina and with hydrocephalus resulting therefrom.

3. Undoubtedly, the disease occurring in adult life, follows an inflammatory process which may or may not have been clinically evident. Probably, failure of the foramina to develop accounts for the hydrocephalus in many cases which are recognized soon after birth; in other infants an intrauterine or postnatal inflammation is the cause.

4. Although the general results of the occlusion are the same in every case, there are marked local anatomical differences due to the extent of the inflammatory process and the time of its development.

5. There are no clinical features which permit one to make an absolute diagnosis of occlusion of the foramina of Magendie and Luschka. In every instance, both in adults and infants, the diagnosis of hydrocephalus is possible; the exact site and the character of the obstruction causing the hydrocephalus can be determined by ventriculography and by phenolsuphonephthalein test.

6. The lesion can always be found at operation.

7. An operative treatment is presented. Two adult cases have apparently been cured by the procedure, which attacks the cause directly.

Rotation-Dislocation of the Astragalus. ROBERT OLLERENSHAW, *British Medical Journal*, January 29, 1921.

Dislocation of the astragalus alone is not a very common accident. The usual displacement is forwards—a condition which often results in a compound dislocation. A more uncommon displacement is backwards. Dislocation of the bone by rotation in its bed is rare, and when it does occur it is not possible to effect a reduction by manipulation. In this form of dislocation the astragalus is frequently detached from all its ligaments. Open operation is necessary, and removal of the astragalus has been the general procedure in the recorded cases. Stimson, in his book refers to seven cases. He insists that the description should include only those cases in which the astragalus has undergone rotation round a vertical or an antero-posterior axis, but still remains mainly within the tibio-fibular mortise. Barwell recommends primary removal of the astragalus in all cases of rotation-dislocation in which "certain and sufficient, but not too persevering, attempts at reduction" have failed.

In Ollerenshaw's case, while walking with the right foot well advanced a heavy piece of timber fell from a height and struck the back of the left heel. There was an obvious dislocation of the astragalus, the upper articular surface being palpable below the skin on the outer aspect of the dorsum of the foot. There was also a fracture of the fibula two inches above the tip of the malleolus. *X*-ray examination showed the dislocation to be a rotation of 90° round the vertical axis.

Manipulation was entirely unsuccessful. A curved incision was made from a point one and a half inches above and behind the outer malleolus curving across the prominence of the astragalus to the mid-line of the foot. The upper and outer surfaces of the astragalus were exposed lying imme-

diately under the skin, and the tendon of the peroneus tertius, almost completely frayed through, was found crossing the wound. This tendon was retracted inwards, and it was then found that the astragalus was completely free from all its attachments, the posterior surface pointing directly outwards and the head inwards. By forcing the foot into an exaggerated varus position and turning the bone it was possible to replace it. The foot was then everted, and the torn dorsal ligaments repaired and the peroneus tertius tendon sutured. The fibula fracture was positioned, the wound closed, and splinted on a metal shoe with a rectangular foot piece.

Gentle effleurage was commenced a fortnight later with active flexion and extension of the ankle under supervision to ensure that no inversion of the foot should occur. In the intervals of treatment the foot was retained in the splint. Six weeks after operation there was very useful movement. Weight-bearing was not permitted until three months had elapsed. Since that time the man has walked comfortably.

Cysts and Fistulae of the Thyroglossal Duct. P. K. GILMAN, San Francisco, *Surgery, Gynecology and Obstetrics,* February, 1921.

Discussing the embryology, anatomy and pathology of thyroglossal duct, cysts and fistulæ Gilman cites ten cases, giving their diagnosis and treatment, and concludes:

1. Lesions due to the persistence of a portion of the thyroglossal duct are not rare and must be considered when attempting a differential diagnosis of abnormalities occurring along the course taken by the thyroid "anlage" from the base of the tongue to the region of the thyroid isthmus.

2. Thyroglossal lesions occur in the mid-line of the tongue or neck.

3. Median cervical sinuses occur singly, are never congenital as is the case in branchial cleft conditions, which moreover are lateral in their position, though the median lesions may appear at any time after birth.

4. Median cervical sinus is always preceded by swelling which ruptures or is opened by the surgeon under mistaken diagnosis, and which never closes permanently. Mucus is discharged unless it becomes purulent through infection.

5. Cysts of this structure show certain points of election and their contents vary somewhat according to their age and the predominence of certain elements in their walls.

6. Thyroglossal lesions are more common in women than in men and in the first twenty years of life.

Spontaneous and Operative Cure of Cirrhosis of Liver; Report of Illustrative Cases. DAVID RIESMAN, Philadelphia. *Journal of the A. M. A.* January 29, 1921.

Riesman reports a case of cirrhosis of the liver in which there was marked ascites with general enlargement of the veins of the abdomen and a very typical caput medusae, as well as edema of the legs. Tapping was resorted to repeatedly. At each tapping, except the last one, from 3½ to 4½ gallons of straw colored fluid were removed. Despite the tapping, the edema of the legs steadily increased until the limbs became of such enormous size that they could not be lifted or moved in the slightest degree. The scrotum was also greatly swollen. After the thirty-sixth tapping, about ten months after the first tapping, Riesman detected over the abdomen, particularly in the region of the liver and spleen, friction, appreciable both to touch and to the ear. Over this area of friction there was also considerable tenderness. The abdomen did not fill up again. Not only was there no return of ascites, but all the edema of the hugely swollen legs and of the scrotum disappeared. The man was able to be up and about, and even left the hospital. At present there is no ascites; the venous distention and the caput medusae have disappeared. Riesman suggests that, as indicated by the extensive friction, pain and tenderness, a fibrinous peritonitis followed the last tapping. The adhesions resulting from this peritonitis constituted a spontaneous Talma operation and sufficed to establish an adequate collateral circulation. In two other cases reported a cure was effected by the Talma operation.

Some Surgical Aspects of Asphyxia. EVARTS A. GRAHAM, St. Louis, Mo., *Annals of Surgery,* February, 1921.

By asphyxia in this article is meant not only an interference with the intake of air into the lungs, but also any disturbance in the free interchange of oxygen and carbon dioxide in the tissues and any disturbance of oxidative processes which results in the formation of abnormal amounts of products of incomplete oxidation.

Asphyxial conditions may therefore be produced in any of the following ways: (1) An interference with the intake of air, (2) an interference with the power of the blood to carry oxygen or to remove carbon dioxide, (3) an interference with the circulation of the blood, and (4) a disturbance of the power of the tissues to utilize oxygen. All of these factors are of interest to the surgeon, and he may encounter all of them even in the same patient.

Interference with the intake of air is the result of not only obstructions of the upper air-passages but also of pulmonary disturbances which give rise to a diminished alveolar surface. These latter disturbances are due both to changes within the lungs, such as inflammatory exudates, and to abnormal pressures outside the lungs which limit their normal expansion. The principal agents which restrict the expansion of the lungs by pressure, are air and fluid.

The disturbances within the thorax which are caused by abnormal changes of intrapleural pressure are discussed in detail from the standpoint of new experimental work, as a result of which it seems evident that the previous, commonly accepted ideas are incorrect.

From the standpoint of pressure relationships the normal thorax may be regarded practically as one cavity instead of two. Any change of pressure in one pleural cavity is accompanied by practically an equal change in the other, so that an equilibrium of pressure exists at all times throughout the whole thorax.

The prevalent conceptions of pneumothorax are erroneous in that they are based on the assumption that when an opening is made into the chest one lung is collapsed and the other maintains respiration. This assumption implies that the mediastinum constitutes a rigid partition between the two pleural cavities. On the contrary, the mediastinum in the normal thorax is so mobile that any increase of pressure in one pleural cavity pushes it over into the opposite one so that both lungs are compressed practically equally. If, on the other hand, the mediastinum has been made rigid by induration as a result of long-standing inflammation, or if it has become fixed by adhesions, then a pleural opening on one side will not produce the same pressure changes in both pleural cavities.

The maximum opening into a pleural cavity which is compatible with life depends upon a definite relationship which exists between the amount of air entering the lungs and the amount entering the pleural opening. The maximum opening compatible with life may be approximately determined for the normal chest by a mathematical expression. It is found that an average normal man should be able to withstand for a short time an opening of about 64.8 sq. cm. (10 square inches); one with a "vital capacity" greater than the average will be able to withstand a larger opening. There is harmony, therefore, between these results and the finding at the front that men were able to maintain respiration with gaping thoracic wounds which seemed surprisingly large.

A double open pneumothorax in a normal chest is more dangerous to life than a unilateral open pneumothorax merely because usually the combined areas of the two openings (and therefore the amount of air admitted into the pleural cavities) is greater than a single opening on one side is likely to be. Theoretically and experimentally effects of practically the same severity result in the case of one or more openings into the pleural cavity as follow the creation of a double pneumothorax, provided that in each case the combined areas of the various openings are equal.

The bearing of these results and deductions upon both the treatment of acute empyema and upon thoracic surgery in general is obvious. Whenever the amount of air taken into the lungs is limited by the presence of an active pneumonia,

with plugging of both air channels and alveoli, whenever there is an excessive demand for air, whenever there is a sufficient weakening of the respiratory muscles to impair compensation, or, in short, whenever there is a marked reduction in the "vital capacity," the size of a pleural opening compatible with life becomes smaller; and if any or all of the above factors are present in sufficient intensity, even a very small opening into the pleural cavity will produce death from asphyxia. Since all of these factors are likely to be present to a high degree during the early stage of an empyema of the streptococcus type, early operation with the establishment of an open pneumothorax carries with it an unwarrantable danger. Either a method of repeated aspirations or one of closed drainage is indicated until after the above dangerous factors have disappeared.

Interference with the ability of the blood to carry oxygen or to remove carbon dioxide is of interest to surgeons chiefly in connection with anemia, both acute and chronic, and perhaps rarely in poisonings of the type of carbon monoxide-poisoning.

Interference with the circulation of the blood is of surgical importance not only locally in connection with the ligation or destruction of an artery, but also in heart disease, in shock, and in pneumothorax.

An inability on the part of the tissues to utilize oxygen is seen especially in narcosis with the common general anesthetic agents and also in intoxications with acids, cyanides, etc.

The effects of disturbances of tissue respiration are both anatomical and physiological. The former consist, in general, of the syndrome of edema, fat infiltration, hemorrhages, and necrosis. The physiological disturbances comprise the phenomenon of so-called "acidosis," changes in the respiration, glycosuria, etc. The importance of an impaired kidney funcion as a factor in the production of an "acidosis" is emphasized and discussed.

The applications of these ideas to various definite surgical conditions are discussed.

Roentgen Ray Therapy in Hyperthyroidism. WALTER C. BARKER, Philadelphia. *N. Y. Medical Journal*, February, 12, 1921.

Before using the roentgen ray as a therapeutic means, a roentgen examination should be made of the mediastinal region, to determine the presence of a submerged thyroid or hyperplasia of the thymus. Examination should be made to determine the cause of the hyperthyroidism, and when possible this should be remedied. Full doses of high penetrating roentgen ray should be used and the proper interval between treatments allowed, so as to note the effect before repeating the dose. Other endocrine glands should be irradiated when they are hyperactive. The reduction of the size of the thyroid for cosmetic purposes, for the relief of pressure or for removal of tumors, whether benign or malignant, is a problem for the surgeon and should never be attempted by roentgen therapy; the use of the roentgen ray in the treatment of the thyroid is only to inhibit the cell action in hyperthyroidism. It will here take the place of surgery with results which are as good and without scar and the dangers attending an operation.

Regional Anesthesia. GASTON L. LABAT, Rochester, Minn., *Annals of Surgery*, February, 1921.

Nerve blocking may be accomplished by four methods, the judicious combination of which meets the purposes of any operation:

1. Blocking the nerve terminals in the immediate vicinity or around the operative area.

2. Blocking the nerves at any point from the spine or skull foramina to the area they supply. The nerves are more accessible in the superficial layers in the immediate vicinity of fixed landmarks. When the anesthetic solution is injected close to the spine, the method constitutes paravertebral conduction anesthesia, the Laeven method.

3. Blocking the roots within the spine, but outside the dura mater; called the extradural, epidural or sacral method.

4. Blocking the roots within the dura; known as the intradural or spinal analgesia.

Book Reviews

Orthopedic and Reconstruction Surgery, Industrial and Civilian. By FRED H. ALBEE, A.B., M.D., Sc.D., F.A.C.S., Professor and Director of Orthopedic Surgery, N. Y. Post-Graduate Medical School, and the University of Vermont; Chief Surgeon, U. S. Army General Hospital No. 3, etc., etc. Royal octavo; 1138 pages; 804 illustrations, many in colors. Philadelphia and London: W. B. SAUNDERS Co., 1919.

It is rather a long cry from such familiar text-books of orthopedic surgery as those, for example, of Bradford and Lovett and of Whitman, to the massive, elaborate and richly illustrated treatise of Albee, which includes within its scope pretty much the entire range of surgery of the bones and joints. From the smaller text-books mentioned the student may acquire information concerning the pathology and symptomatology of orthopedic diseases and deformities, and the general principles of treatment, especially of treatment by corrective or supportive appliances. But they do not give the reader, as Albee's work also does, a complete exposition of the operative relief and operative restoration of all the skeletal diseases and deformities.

The smaller text-books are representative of the orthopedic surgery of the older generation; Albee's is representative of the younger generation. It marks the dividing line between them, and it points the way to the specialists that are to come. There is no reason why the general surgeon should yield to them the surgery of the bones and joints; but there is no reason why they should not also occupy it. All that Albee includes in this splendid work may properly fall within the sphere of an orthopedist, and although he entitles his work "Orthopedic *and Reconstruction* Surgery," he might with entire propriety have called it simply "Orthopedic Surgery". Probably he enlarged the title to indicate that he was calling his colleagues into fields that they well might share with the general surgeon; or perhaps it was because, during the war, reconstructive surgery was a labor which orthopedic and general surgeons shared impartially. Such reconstructive surgery, however, as deals with plastic operations on the soft parts, and on the peripheral nerves, is not included in this work (except, *very briefly*, in the chapter on Military and Industrial Reconstruction Surgery).

This treatise is based on a wide study of the literature, and the references are very numerous. (There is a bibliography at the end of each chapter). Here and there, recent articles of value, or the latest article by the authors quoted, were overlooked. Included with all this is a description of the author's many original methods and operations. These, including his bone saw motor, have been published in various articles and, some of them, in his book "Bone Graft Surgery" (Saunders, 1915). In this new treatise he gives a thorough exposition of the principles and technics of his bone inlay operations, and of the employment of his motor, admirably illustrated—as is the entire book. He describes also his recently devised motor bone clamp—an apparatus for open reduction adaptable to his motor; and his fracture table, an improvement upon that of Hawley. Included, too, are some reconstructive operations devised while he was in charge of the service at U. S. A. General Hospital No. 3, at Colonia, N. J.

The non-operative treatment of fractures is not dealt with, except of the hip, the tarsus and the carpal scaphoid. There is much information, however, concerning the reduction of fractures, and a chapter on plaster of Paris technic. Arthroplasties and arthrodesis, operations for osteomyelitis, skeletal tuberculosis, tendon transplantations, congenital and acquired deformities—these and all the other topics commonly described in text-books on orthopedics are dealt with in detail. Very interesting is the chapter of 100 pages on *military and reconstruction surgery* covering some topics not previously presented and also illustrating the application of bone graft surgery to particular types of tissue loss.

Altogether, we regard this treatise as a valuable addition

to surgical literature and we warmly recommend it as an adequate, forward-looking and thoroughly modern exposition of orthopedic surgery.

Chirurgie Reparatrice et Orthopedique. Publie sous la Direction de E. JEANBRAU, P. NOVE-JOSSERAND, L. OMBREDANNE et P. DESFOSSES (Secretaire de la Redaction.) *En deux Volumes.* Octavo; 1340 pages; 1040 figures. Paris: MASSON ET CIE, 1920.

This admirable work, which appeared soon after the treatise by Albee under the same title, is quite different in its contents. It is not concerned with those congenital deformities and tuberculous or otherwise infectious diseases of the bones and joints that we ordinarily include within the scope of orthopedic surgery; but it does deal, very extensively, with all those injuries, disorders and deformities that may be produced by external violence, requiring major surgical attention for immediate treatment or for subsequent repair. It is, indeed, a work on major traumatic surgery—of the head, face, neck, chest, abdomen (incompletely), spine and peripheral nerves, as well as of the bones, joints, muscles, tendons and vessels.

It is the first work of this kind to appear, in France, at any rate, and is the composite expression of the brilliant studies of French surgeons and neurologists during the war. It is, however, not merely an exposition of military surgery, nor was it planned as a review of that subject. It is intended, rather, as a treatise on modern traumatic surgery, as a guide in the management of major injuries in civil life—the accidents that occur in the mill and the factory, in building construction, in railroad wrecks, on shipboard or in the streets.

The two vloumes are the work of 48 eminent authors, including the editors. We need but mention a few of the well-known names to indicate the authoritative character of this treatise—Lemaitre (who wrote the introductory chapter on the treatment of wounds, describing the principles and technic of the methods he principally evolved and which are familiar to us under the generic term, "débridement"), Cuneo, Dujarier, Imbert, Lecène, Roux-Berger, Mme. Athanassio-Benisty.

The first volume deals with: new methods of wound treatment; the extraction of foreign bodies; the repair of skin, muscles, tendons, aponeuroses, bloodvessels, nerves, bones, joints; the affections of amputation stumps; orthopedic and prosthetic appliances; the complications—infectious and otherwise—of traumatisms. Following these general subjects, which occupy about 400 pages, it considers injuries to the head (cranio-cerebral, facial, orbital, mandibular—and their plastic and prosthetic restoration, the salivary structures and the mouth), the neck, (contractures, esophageal, laryngeal and tracheal wounds, etc.), the thorax, (wounds of the chest wall, intrathoracic projectiles), the spine and the cord, the abdomen (pseudo-hernia, intestinal fistula and artificial anus, urethral fistulae. Other abdominal and genital injuries are not considered!)

Volume two is devoted to the surgery of injuries, and of the results of injuries, to the extremities—as concern the individual joints, bones, nerves, amputation stumps, etc.

While the work is distinctively French it is written on broad lines and the methods of American, English and Italian surgeons are frequently referred to and illustrated.

Surgery. Its Principles and Practice. For Students and Practitioners. By ASTLEY PASTON COOPER ASHHURST, A.B., M.D., F.A.C.S., Associate in Surgery in the University of Pennsylvania; Surgeon to the Episcopal Hospital and to the Philadelphia Orthopedic Hospital and Infirmary for Nervous Diseases; Colonel, Medical Reserve Corps, U. S. Army. *Second Edition.* Royal octavo; 1170 pages; 1129 illustrations; 14 color plates. Philadelphia and New York: LEA & FEBIGER, 1920.

It is today quite impossible to confine within the limits of a single volume—even though it were larger than this one—a comprehensive treatise on general surgery. A single-volume work can be but a text-book for students, a description of salient facts for the practitioner. To prepare such was, obviously, the purpose of Ashhurst, and, judged accordingly, he has produced an excellent work, presenting several admirable features. Among these the many fine original photographs and sketches deserve mention.

In this edition one finds much new matter or revisions in the sections on gunshot wounds, infected wounds, Carrel-Dakin treatment, compound fractures, shock, empyema thoracis, carcinoma of the tongue (including the description of the author's operation), infections of the hand, etc., and more than one hundred new illustrations, all of them excellent.

We found the text very interesting throughout. The author has the knack of condensing information and presenting important features clearly. To be sure, one may find—one is bound to find in such a work—things that may be criticised or disputed. Nor could one expect, perhaps, that all surgical diseases and affections would be referred to in such a text-book. Thus, there is no mention of trochanteric bursitis or of tuberculosis of that bursa. The brief description of subdeltoid bursitis is faulty in every particular—diagnosis, pathology, symptomatology and treatment—and quite ignores published facts. There is no *x*-ray picture of the fairly common subbursal lime deposits that often are found in this affection, and no reference to such an occurrence—although this common finding and other demonstrations quite dispose of Thomas' claim that in most of these cases of shoulder complaint ("periarthritis") the main lesions are in the axillary region of the joint, with which opinion Ashhurst expresses agreement.

It seems to us that the medical student reading the section on hyperthyroidism will have an exaggerated notion of the curability of the disease by surgery; but that is a criticism that can be made of many other works—medical as well as surgical.

The description of the varieties of abdominal herniae is excellent, and so is that of the technics of inguinal herniorrhaphy. Without confusing the student with too many variations it presents to him very clearly all the essentials, and the important details. We do not believe, as Ashhurst seems to do, that chromicized catgut is sufficiently reliable for inguinal hernioplasties; kangaroo tendon, not too course, seems to us a much more dependable material for these operations. Ashhurst prefers the inguinal to the femoral approach in operations for femoral hernia. In this many surgeons agree with him. The reviewer believes that the femoral route, in most cases, affords opportunity to do all that can be accomplished from above: it is simpler and does not open up the intact inguinal canal; the sutures can be placed in the same position from below as from above; and, since the peritoneum can easily be dragged down as far as one wishes to, the sac can be tied off so high that the stump disappears deeply in the abdominal cavity—and it is this supposed advantage of high ligation of the sac that is claimed as the chief merit of the inguinal operation.

This edition shows extensive and careful revision. The work is attractive as well as very readable and, for the most part, the text is reliable as well as up-to-date. Altogether, we regard it as a very acceptable text-book, and would place it among a very few to be recommended to American students and practitioners.

Surgery. A Text-Book by Various Authors. Edited by GEORGE E. GASK, C.M.G., D.S.O., F.R.C.S. (Eng.), Surgeon and Director of the Surgical Professorial Unit, St. Bartholomew's Hospital, and HAROLD M. WILSON, M.S., M.B., (Lond.), F.R.C.S., (Eng.), Surgeon, with Charge of Out-Patients, St. Bartholomew's Hospital. Royal Octavo; 1186 pages; 467 illustrations; 39 plates, 20 in color. London: J. & A. CHURCHILL, 1920.

In 1910 two of the authors of this work, Spencer and Gask, published a text-book of surgery as a continuation, a "tenth edition", of Walsham's well-known "Surgery". In a measure, this new product might be regarded as a continuation, or modernized edition, of Spencer and Gask's, not merely because of this element of common authorship but because all the fifteen other contributors (W. Girling Ball,

W. McAdam Eccles, Reginald C. Elmslie, Sir Charles Gordon-Watson, H. E. Griffiths, W. Douglas Harmer, R. Foster Moore, Sir D'Arcy Power, L. Bathe Rawling, J. E. H. Roberts, K. M. Walker, H. J. Waring, C. Ernest West, Herbert Williamson and Harold Wilson) are surgeons on the staff of the same hospital—St. Bartholomew's. Indeed, it was by this intimate association of the contributors that the editors expected to avoid the bad features of multiple authorship, viz., unevenness of merit and contradictory views. This, it seems to us, has been accomplished. The book contains some of the illustrations used in Spencer and Gask's and is of about the same size. In bulk, it is rather less than that of the last edition of DaCosta's Surgery, which contains about 400 more pages; but the English work is printed in somewhat finer type. Certainly it contains more descriptive matter than several other single-volume works on surgery. Much of this, however, is taken up by the surgery of the eye, the ear, and the female generative organs, and by gonorrhea—subjects to which many like works of American authorship give little or no space.

The text deals chiefly with pathology, symptomatology, diagnosis and modes of treatment. Operations are described but briefly; and this seems wise in a text-book of this character, for adequate exposition of operative procedures would require another volume. References are omitted altogether. They are not essential to the student, but they interest and stimulate him. Their inclusion also stimulates the authors of scientific books to accuracy and up-to-dateness.

In any single-volume work on general surgery, even one as bulky as this, there must be omissions, even omissions of rather important clinical data; and it can hardly be expected that authors and critics could agree upon where to draw the line in accomplishing the necessary condensation. The writer's interest in or special familiarity with certain subjects is bound to influence him; and, correspondingly, the reviewer might be tempted to criticize the failure to include or to elaborate those special topics in which he happens to be particularly interested or informed. It may be said, however, that the authors have, in this respect, followed the path of least resistance and have produced a text-book along well-established lines, and much more comprehensive than many similar works. It must be remembered, too, that the purpose of the editors was "to supplement, but not to supplant, teaching at the bedside and clinical lectures".

In any work on surgery, whether by one author or many, the critic may also find measures recommended that he believes to be undesirable or outworn. It is no severe stricture, therefore, to say that we have found some in this book. Thus, concerning appendicitis with abscess, it is advised that "in the case of a large localized abscess a simple incision should be made into the abscess cavity and a drainage tube inserted without making at the time any further search for the appendix". This is sage advice for the inexperienced operator, called upon to treat such a case in an emergency; and it is a wise thing for the experienced surgeon in those few cases where his judgment indicates it. But it is not the routine practice among experienced surgeons in America who, we believe, usually remove the appendix, even in the presence of a large abscess; and we incline to the belief that in competent hands the one-stage operation has a lower mortaliy as well as a much reduced period of hospitalization, and less likelihood of hernia. This must be, of course, largely a matter of opinion; and so, too, is the question of following the advice given to stitch the gall-bladder to the abdominal wall when performing cholecystostomy. We thought this procedure had been generally abandoned as unnecessary and, since it interferes with the respiratory movement of the liver, quite undesirable. We think, too, that we would limit our choice of cholecystostomy, instead of cholecystectomy, much more than the author of this section (Gask), but this also is a matter in which surgeons have not quite agreed.

Altogether, this is a good text-book for the medical student, and a very useful one for the general practitioner. It is a worthy successor to Walsham's, from the pens of some of England's most celebrated surgeons.

Die Chirurgie der Brustorgane. von Ferdinand Sauerbruch. Zugleich *Sweite Auflage* der "Technik der Thoraxchirurgie" von F. Sauerbruch und E. D. Schumacher. *Erster Band*: Die Erkrankungen der Lunge, unter mitarbeit von W. Felix, L. Spengler, L.v. Muralt, E. Stierlin, H. Chaoul. Large Octavo; 860 pages; 637 illustrations. Berlin: Julius Springer, 1920.

Professor Sauerbruch has enlarged his original 90-page volume on the technique of thoracic surgery into an encyclopedic two-volume system of surgery of the chest. The first volume, before us, includes valuable chapters on the anatomy, physiology and radiography of the chest and lungs, as well as chapters on their pathology and surgical treatment. The illustrations and the mechanical appearance of the book are equal to the best of Germany's pre-war publications. There is an exceptionally full classified bibliography and a complete index.

Unfortunately, the work of American pioneers in this field has not been adequately considered. In the chapter on endoscopy, no mention is made of the distally illuminated tubes of Chevalier Jackson or of the remarkable endoscopic accomplishments of Jackson, Lynch, Lynah or Mosher and a host of others. No reference is made to Yankauer's endobronchial lavage of abscess cavities. Diphtheria is unmentioned although tracheo-bronchial diphtheria reqires the most expert surgical handling as has been demonstrated by Lynah at the Willard Parker Hospital.

In the chapter on artificial pneumothorax, to which 104 pages are given, the valuable technique of W. Parry Morgan with differential manometers is neglected, nor is there allusion to the substitution of filtered air for nitrogen as recommended by Forlanini originally.

The chapter on operative treatment of pulmonary tuberculosis is especially full, including the Brauer-Friedrich operations as well as Sauerbruch's operation for incomplete pneumothorax. Other procedures described are pneumolysis, tamponade, fat transplantation and resection of the phrenic nerve. There is a brief but instructive chapter on tumors of the lung. There is an interesting chapter describing Trendelenburg's attack on embolism of the pulmonary artery. One of the cases operated by Schumacher in the author's clinic survived five days.

The technique of differential pressure is lauded but the remarkable work accomplished by Duval and other surgeons without its aid, apparently has been overlooked.

It would be very unfortunate if these remarks were to convey the impression that Sauerbruch's work is essentially lacking in completeness. There is too much merit in the book to permit that idea to remain by implication. The omissions are such as we hope will be corrected in a future edition, which its inherent worth will surely demand.

The Treatment of Wounds of Lung and Pleura. Based on a Study of the Mechanics and Physiology of the Thorax. Artificial Pneumothorax—Thoracentesis—Treatment of Empyema. By Prof. Eugenio Morelli, Assistant in the Medical Clinic of the Royal University of Pavia; Maggiore Medico, Field Hospital No. 79. Translated from the Italian by Lincoln Davis, formerly Lieutenant-Colonel, M.C., U. S. Army and Frederick C. Irving, formerly Major, M.C., U. S. Army. Octavo; 214 pages; illustrated. Boston: W. M. Leonard, 1920.

Davis and Irving have performed for English-speaking surgeons and physicians a distinct service in preparing this excellent transalation of Morelli's recent and important book. While they were attached to the A. E. F. in Italy they had the opportunity of observing some hundred of the cases treated by Major Morelli in Italian Field Hospital 79, which was under his direction and devoted exclusively to wounds of the lung and pleura, and they were convinced of "the far-reaching and beneficent effects of his artificial pneumothorax treatment in wounds of the lung". The reader will also be convinced, we believe, of the beneficence of his simple, original methods, not only by the logic of his discourse but by the array of his case records. The reviewer

was so fascinated by the book that he could not lay it down until he had read it through!

Morelli was assistant of Forlanini, who wrote a touching introduction to this work two days before his death, and who in 1882 introduced artificial pneumothorax in the treatment of phthisis—a method for the conception of which John B. Murphy also deserved credit, and which, though practiced regularly in Forlanini's clinics, was not recognized and accepted generally for over 30 years. Ten years ago Morelli published some of his adaptations of Forlanini's method to other intrapleural affections, and he had evidently conceived then its application to traumatic lesions, which the war gave him the opportunity to put to the test.

Just as Forlanini's and Morelli's methods (e. g. air replacement when emptying a pleural effusion) have not been learned and practiced by physicians generally, so, too, Morelli's methods in the management of wounds of the pleura and lung appear to be considerably in advance of the practices of other surgeons in the war.

We shall not review the physiological-mechanical principles, so clearly laid down by Morelli, upon which he based his methods, to whet our readers' desires for a more intimate acquaintance with the book, shall merely mention some of the accomplishments of his methods of treatment. He has so modified and so well described the technic of artificial pneumothorax that, using a simple apparatus with the precautions he lays down, the procedure becomes an easy one, free from danger. He shows that, in penetrating wounds, artificial pneumothorax arrests pulmonary hemorrhage by collapsing the lung, brings prompt relief of distress, facilitates closure and healing, and goes far to prevent adhesions. In cases of wounds of the lung, he evacuates the hemothorax, by needle, as promptly as possible and arrests further bleeding by immediate artificial pneumothorax. and thus reduced the number of cases of empyema development to less than two per cent.! In cases of contusion of the lung—where there is no hemothorax—artificial pneumothorax, by collapsing and immobilizing the lung, obviated the common development of broncho-pneumonia and pulmonary abscess. Because small amounts of blood remaining in the complementary spaces after thoracentesis for hemothorax form a nidus for bacterial growth (empyema) and produce fibrin deposits, he often washes out all this blood, after introducing the air and through the same apparatus.

The phenomena of what we have called "sucking wounds" of the chest are only in part, he believes, explicable by oscillation of the mediastinum. In part they are due to pleural reflexes—a sort of "pleural eclampsia". While he regards it as important that air should be allowed to enter the chest (pneumothorax) in pulmonary wounds, this entrance should not be tumultuous; an open wound in the chest wall should be plugged or otherwise closed as soon as possible—at the Field Hospital or even on the battlefield. For this purpose he devised a set of dumb bell shaped distensible rubber balloons, to be inserted and expanded in the wound. He describes their advantages over gauze tamponade and over sutures. They do not work well in large wounds and in these, too, Morelli believes that empyema is inevitable; and in all such cases he combines with, or soon adds to, his primary operation, a thoracotomy for drainage, even before pus appears. He does not believe, apparently, that missiles left in the lung are a source of later danger; and we judge that he does not advocate their removal, except perhaps, in the case of large, irregular eclats with fragments of clothing. The nature of the lung lesion is a smaller factor than the nature of the wound in the chest wall. Missiles lodged in the pleural cavity are more dangerous, says Morelli, than those lodged in the lung. Concerning this phase of the subject, however, very little is said. Morelli shows that the rapid passage of a missile through the pleural space does not sufficiently contaminate it to cause its infection. That infection comes (from an open wound or) from the lung. Hence Morelli urges the importance of promptly closing the lung wound, not by suturing it as other surgeons did, but by artificial pneumothorax.

The adaptation of these methods to the evacuation of serous and purulent effusions, will interest the medical as well as the surgical practitioner. For empyemata Morelli employs a closed system of suction-drainage—using a tube passed through an hour-glass dilatable bag to close the wound—and can easily manipulate his apparatus to irrigate the cavity or to maintain positive or negative pressure within it, as indicated. With more or less similar closed drainage and suction systems we are familiar. Whether Morelli's method is on the whole better than, for example, sterilization by Carrell-Dakin technic it is probably hard to say.

Following 65 case reports is a "discussion of cases". In a series of 110 cases treated at the field hospital August to October 1917, there were but 5 deaths. "It is not the small number of deaths *per se*, but rather an examination into their causes and a study of the functional results of cured cases, which obligate a critical consideration" and in Morelli's opinion recognition of his method of treatment.

Injuries of the Peripheral Nerves. By HENRY S. SOUTTAR, C.B.E., F.R.C.S. ENG., M. CH. OXON., MAJOR, Ex-R.A.M.C., Assistant Surgeon and Director of the Surgical Unit, London Hospital; Late Senior Surgeon, British Red Cross Hospital, Netley; and Deputy Consulting Surgeon to the Southern Command; and EDWARD W. TWINING, M.R.C.S., L.R.C.P., Lond., Captain, Ex-R.A.M.C., Medical Officer in Charge of Physical Treatment Department, Pensions Hospital, Netley; late Medical Officer in Charge of Physical Treatment Department, British Red Cross Hospital, Netley. Octavo; 152 pages; 30 illustrations. New York: WILLIAM WOOD AND COMPANY, 1920.

The war has provided us with a rich and steadily growing literature of peripheral nerve injuries—their various manifestations, concerning which a vast amount has been learned; and their treatment, in which certain principles have been definitely established, and some methods have been clearly proven to be unphysiological and ineffectual. This small and modest book has a useful place among volumes more pretentious and complete. It is not put out as an exhaustive discussion of the subject, nor even as a text-book. It is, rather, a very readable, simple statement of the salient facts concerning the symptomatology, tissue changes and processes of repair in injuries of motor, sensory and mixed nerves in general and of the more important nerves in particular; diagnostic procedures and analysis of findings; operative repair; and physical treatment. It is in no sense a discussion of the literature, but is based essentially on the war experience of the authors at the British Red Cross Hospital, Netley. As such, it might well have been expanded into a more comprehensive exposition of the symptomatology of peripheral nerve injuries and a more detailed description of operative and non-operative treatment. In its condensed form it is, however, an excellent introduction to a closer study of the subject and, as we have said, a well-conceived statement of the most important facts established by the experiences of the past few years.

Like others who have studied their results carefully, Souttar and Twining clearly indicate that the proper operation, whenever possible, for a divided or resected nerve is end-to-end suture. Even large gaps in a nerve can often be overcome by nerve-freeing and traction, by two-stage operations (preliminary suture of bulbous ends to effect stretching and later resection of the bulbous ends), by posture, and, if need be, by bone-shortening. Three other types of operation have produced good results in a smaller number of cases, but none of them is to be preferred to meticulous end-to-end suture. These are: the flap operation; insertion of free nerve grafts into the gap; and lateral implantation. In the latter operation (one or both ends of a divided nerve may be implanted into another nerve) it is essential to cut across those fibers of the sound nerve that are to be diverted into, or receive the down-growing axons from, the injured nerve. Merely tacking the end of a nerve to the side of another provides no means of regeneration. As a physiological basis for these operations of implantation or "anastomosis" the authors say "the operation can be carried out without any permanent injury to the contributory nerve. In any ordinary nerve, such as the median in the upper arm, one-

third of the fibers may be divided without any permanent loss of function. This is not true of the sciatic as a whole since it consists of two distinct portions, the internal and external popliteal, but it is true of each of these portions separately. A reservation must also be made regarding the part just above the point where a branch is given off...."

A nice problem that the surgeon may be called upon to decide is when and when not to resect a nerve thickened, or partly divided at the site of injury. The indications for resection in certain types of neuroma and scar infiltrations have not been definitely established. The authors do not refer to neuromata, but they briefly discuss the question of resecting partly divided, scar-invaded nerves. "Empirically, at least", they say, "it would appear that the hard scars should be resected and the soft scars left alone" and "if the scar is densely hard; if, above all, the upper end of the nerve shows evidence of bulb formation, resection is inevitable". They point out how much can be accomplished, when the latter condition does not exist, by freeing the nerve (external neurolysis) and protecting *its mobility* in a bed of muscle, or in a nourished flap of fat and fascia. Internal neurolysis, a tedious and delicate operation that has been much in vogue in Germany, they believe to be only occasionally indicated.

There is a chapter on "alternative methods" (tendon transplantation, joint ankylosis, artificial tendons and ligaments), and a brief one outlining some methods of treating causalgia.

Studies in Neurology. By Henry Head, M.D., F.R.S., in conjunction with W. H. R. Rivers, M.D., F.R.S., Gordon Holmes, M.D., C.M.G., James Sherren, F.R.C.S., Theodore Thompson, M.D., and George Riddoch, M.D. *In Two Volumes.* Imperial Octavo; 832 pages; 182 illustrations. London: Henry Frowde; Hodder & Stoughton, 1920.

In these two volumes are reprinted those important papers, published in *Brain* from 1905 to 1918, inclusive, that established Head as the greatest living investigator of and authority on *sensation.* These papers are: The Afferent Nervous System from a New Aspect, by Head, Rivers and Sherren (1905); The Consequences of Injury to the Peripheral Nerves in Man, by the same authors (1905); A Human Experiment in Nerve Division, by Rivers and Head (1908); The Grouping of Afferent Impulses within the Spinal Cord, by Head and Thompson, (1906); The Automatic Bladder, Excessive Sweating and Some Other Reflex Conditions, in Gross Injuries of the Spinal Cord, by Head and Riddoch (1917); Sensory Disturbances from Cerebral Lesions, by Head and Holmes (1911-12); Sensation and the Cerebral Cortex, by Head (1918). From these papers were omitted only the description of Head's methods of testing sensation. This topic has been rewritten in a separate section of three chapters. There has been added a brief but interesting Epilogue, in which Head reviews these papers and points out the theoretical bearing of a work that "is essentially a study in function by clinical methods in man". There is also an Appendix in which he discusses the more important criticisms of his teachings, viz., those published by Trotter and Davies, by Boring and by von Frey. A table of contents and a good index complete the transformation of these separate studies into a book. Neurologists and neuro-surgeons will welcome the reproduction in this form.

Clinical Ophthalmology for the General Practitioner. By A. Maitland Ramsey, M.D., Fellow of the Royal Faculty of Physicians and Surgeons, Glasgow; Lecturer on Ophthalmology, University of Glasgow; Ophthalmic Surgeon, Glasgow Royal Infirmary; Author of "Atlas of External Diseases of the Eye," "Eye Injuries and their Treatment," "Diathesis and Ocular Diseases," etc. With a foreword by Sir James Mackenzie, M.D., F.R.S., Royal octavo; 500 pages; illustrated. London: Henry Frowde; Hodder and Stoughton, 1920.

This is not a treatise on Ophthalmology for the specialist. It is, as its title indicates, a work for the general practitioner, a clinical guide indicating the recognition of ocular and palpebral lesions, in their developmental as well as in their advanced states, and their treatment. In therapeutic measures the author indicates those that can be conducted by the practitioner and those that should be referred to the ophthalmic surgeon. Thus the chapter on cataract is devoted to "the duty of the general practitioner towards a patient suffering from cataract—before, during and after the operation", and but a page is given to a general description of the operation itself (Smith's Indian method). The accidents and complications of the operation and the post-operative care, as these concern the family physician are, however, discussed. There is a useful appendix of *therapeutic notes and formulae* and a *glossary* of ophthalmologic terms.

The work is strictly clinical and altogether practical—a sensible and useful book for the practitioner. The illustrations are for the most part photographic plates, many of them in colors.

Tropical Ophthalmology. By Robert Henry Elliott, M.D., B.S., (Lond.) Sc.D. (Edin.) F.R.C.S., (Eng.) Lieutenant-Colonel I.M.S. (Retired); Late Superintendent of the Government Ophthalmic Hospital, Madras, and Professor of Ophthalmology, Medical College, Madras; Honorary Fellow and Gold Medallist of the American Academy of Ophthalmology and Otolaryngology; Lecturer in Ophthalmology, London School of Tropical Medicine; Ophthalmic Surgeon to the Seamen's Hospital Society, and to the Hospital for Tropical Diseases, Endsleigh Gardens, London. Octavo; 525 pages; 117 illustrations and 7 plates. London: Henry Frowde; Hodder and Stoughton, 1920.

The publication, from time to time, in our periodical medical literature, of observations on various oriental ophthalmic disorders by American surgeons engaged in Near East Relief, has aroused our interest in those many affections of the eye that are more or less peculiar to and common in various parts of Asia and Asia Minor. In this work the author has gathered together in book form, probably for the first time, the most important facts of tropical ophthalmology, based on his own experience in India and on the published observations of others. These references are, purposely, not complete, but were carefully selected from the accumulated literature; and the book represents many years of preparation. We have found its perusal extremely interesting, not merely from the purely scientific standpoint, but also for the insight it gives into all those factors—superstition, ignorance, crowding, dust, heat, and others, that make eye disorders prevalent in the orient, and into those curious methods common to the unqualified native practitioners in medicinal and surgical treatment. (e. g., "couching" cataracts.)

Tropical eye diseases are matters of no small concern to the western nations. An understanding of their causes and the conditions that affect their treatment is essential to their intelligent management by missionaries from those nations. Elliot's book, therefore, quite aside from its value as merely interesting reading matter, is a useful contribution to civilizing efforts, and it certainly will, as its author hopes, "stimulate the young worker to play a man's part in the far-off lands, to which opportunity has led, or necessity has driven him".

Urologische Operationslehre. Herausgegeben von Prof. Dr. Voelcker, in Halle und Prof. Dr. Wossidlo, in Berlin. Bearbeitet von Privatozent Dr. V. Blum in Wien, Geh. Rat. Prof. Dr. F. Colmers, Direktor des Landkrankenhauses in Colburg, Privadozent Dr. L. Kielleuthner in Muenchen, Privatdozent Dr. O. Kneise in Halle a.S.-Geh. Med.-Rat Prof. Dr. Hermann Kummell in Hamburg, Dr. Oscar Orth, I. Ass.-Arzt der chirurgischen Universitatsklinik in Halle, a.S., Privatdozent Dr. R. Paschkis in Wien, Prof. Dr. F. Voelcker, Direktor der chirurgischen Universitatsklinik in Halle, Dr. E. Wossidlo in Berlin, Prof. Dr. H. Wossidlo in Berlin, Prof. Dr. O. Zuckerkandl in Wien. Imperial Octavo; 581 pages; 445 illustrations, some of them colored, and 3 colored plates. Leipzig: Georg Thieme, 1921.

This large and important work, though published in a single volume, is divided into two parts. The first part, edited by Profs. Voelcker and Wassidlo, was almost completed when the outbreak of the war in 1914 made necessary

the postponement of its appearance until 1917. It covers the following subjects: Asepsis, Antisepsis, general, local and paravertebral Anesthesia, by Prof. Colmers; Instrumentation of the Bladder and Urethra, by Kielleuthner; Endoscopic Urethral Operations, by Erich Wossidlo; Open Operations on the Urethra, also by Erich Wossidlo; Operations upon the Prostate, by Prof. H. Wossidlo; Operations upon the Seminal Vesicles, by Prof. Voelcker; Endovesical Operations, by Blum.

The editing of the second part, now finished, and incorporated with the first, was completed by Prof. Voelcker alone, Prof. Wossidlo having died. It includes: Open Bladder Operations, by Voelcker; Operations upon the Kidney and Kidney Pelvis, by Kuemmell; Operations upon the Ureter, by Kuemmell, Zuckerkandl and Paschkis: Operations upon the Urethra, Penis and Scrotum, by Orth; Urologic Operations in the Female, by Kneise.

The work is not concerned with symptomatology, pathology or diagnosis. It deals strictly with the operative surgery of the urinary tract, of which it is a very thorough discussion. It is international in scope, presenting the operative procedures of American, English, French and Italian, as well as German surgeons. It is excellently printed and profusely illustrated, many of the drawings being in color. A bibliography is appended to each subject.

A complete treatise on operative urologic surgery, it is an important book for the general surgeon and for the surgeon specializing in this field.

The Roentgen Diagnosis of Diseases of the Alimentary Canal. By RUSSEL D. CARMAN, M.D., Head of Section on Roentgenology, Division of Medicine, Mayo Clinic; Professor of Roentgenology (Mayo Foundation), Graduate School of Medicine, University of Minnesota. *Second Edition.* Octavo; 676 pages; 626 illustrations. Philadelphia and London: W. B. SAUNDERS COMPANY, 1920.

In roentgen ray diagnosis the most significant advances of recent years has been in its application to abdominal—and especially gastro-intestinal diseases—in which field the author has been an active contributor to its accomplishments. He was the first in America to gather together the scattered published data of gastro-intestinal roentgen diagnosis for publication in a single volume; and his book, based not only on his own vast experience at the Mayo Clinic, but also on the accumulated literature of the world, at once won a well-merited recognition.

This, the second, edition shows considerable revision. About 100 pages and over 100 new roentgenograms and many very instructive case reports, with their roentgen pictures, have been incorporated. There are also two new chapters: an excellent one on *hour-glass stomach;* and the other, on *pneumoperitoneal diagnosis,* in which the author abstracts the literature of this subject but indicates no experience of his own.

In his case reports Carman records candidly several instances in which the operative findings disproved the roentgen diagnosis. In his interpretation of the significance of many findings, e. g., delayed stomach emptying, hypermotility, incisuræ, Carman is far more critical and cautious than many roentgenologists once were or, indeed, than some now are. As illustrative of his critique, we quote his sensible and sardonic comment on roentgen diagnosis of appendicitis: "On the whole, the value of the roentgen signs of appendicitis appears to depend not only upon the intensity of the examiner's endeavor, but also, to some extent, upon the degree of his enthusiasm. Inasmuch as few normal appendices have been found by surgeons or pathologists, the diagnosis of appendicitis upon any grounds whatever is not at all hazardous...." We wish this would soak into those immature roentgenologists who so often and so glibly terminate their long, neatly typewritten, blue-paper-covered and ribbon-tied reports with their cock-sure verdict: "Chronic Appendix"!

What make this work an excellent volume for study and for reference are not merely its completeness, its richness of excellent roentgenograms, and its abundance of bibliographic references, but also its presentation of the subject, its balance, and its "critique".

A Text-Book of the Practice of Medicine. By JAMES M. ANDERS, M.D., PH.D, L.L.D., Professor of Medicine, Graduate School of Medicine, University of Pennsylvania. *Fourteenth Edition,* with the assistance of JOHN H. MUSSER, JR., M.D., Associate in Medicine, University of Pennsylvania. Royal octavo; 1284 pages; illustrated. Philadelphia and London: W. B. SAUNDERS COMPANY, 1920.

Ander's "Practice" has been before the profession almost a quarter-century, during which time it has shared popularity with Osler's as a text-book for medical students and practitioners. In this, its fourteenth edition, it therefore needs no introduction nor extended review.

The work has been thoroughly revised by the author and by Dr. John H. Musser, jr., and examination of its text and bibliographic references indicate that it has been brought quite up-to-date. Thus, the sections on the *heart* are quite representative of recent teachings, and there is a new section on that affection, not new but especially studied during the war, *disordered action of the heart.* Other new matter included is: *streptococcic pneumonia, trench nephritis, chronic aortitis, epidemic encephalitis, botulism, wood alcohol poisoning, bronchial spirochetosis, interstitial emphysema and oxycephaly.*

The section on *influenza* has been re-written, and among many sections that have been much revised are those on *diabetes, scurvy, pernicious anemia, Banti's disease, pellagra, focal infections, yellow fever, measles, tuberculosis, asthma, hay fever, etc.* The discussion of *typhus fever* is quite up-to-date, including reference to the monograph of Danielopolu (1919). Anders appears to accept Plotz' baccillus as the responsible organism, but he properly adds that Rocha-Lima denies this, and he refers to the rickettsia prowazeki, the organism apparently identical with those found by Ricketts, Prowazek and others.

We know of no up-to-date text book of medicine better than Anders'.

The American Year Book of Anesthesia and Analgesia. F. H. MCMECHAN, A.M., M.D., Editor. Quarto; 483 pages; illustrated. New York: SURGERY PUBLISHING COMPANY, 1921.

American Red Cross Work Among the French People. By FISHER AMES, JR. Duodecimo; 178 pages; illustrated. New York: THE MACMILLAN COMPANY, 1921.

This is the last of a series of books published under the auspices of the Red Cross to tell the American people about the vast things their dollars accomplished in Europe, through that organization, during the World War. The books previously printed are: The American Red Cross in the War, The Red Cross in Italy, With the Doughboy in France, and The Passing Legions.

None of these books is a dry-as-dust presentation of statistics, a tedious recital of numbers of hospitals, ambulances, dressings, shirts, comfort-kits or cigarettes. These figures are published elsewhere. They are all, instead, and so is this one of Ames, interesting narratives of conditions and accomplishments. They are books that Americans will enjoy reading, that will make them proud of America and of its great organization of mercy and relief, and proud to be, or to become, members of the American Red Cross.

Stammering, Its Cause and Cure. By G. ROBINSON SKILLMAN. Duodecimo; 78 pages; illustrated. Baltimore: KUEHN BROS. & COMPANY, 1920.

KUEHN BROS. & COMPANY, 1920.

A little book for stammerers by one who cured himself.

BOOKS RECEIVED.

Dermatology, The Essentials of Cutaneous Medicine. By WALTER JAMES HIGHMAN, M.D., Associate Professor of Dermatology, New York Post-Graduate Medical School and Hospital; Acting Associate Dermatologist, Mt. Sinai Hospital, New York; Adjunct Dermatologist, Lenox Hill Hospital, New York; Pathologist, Department of Dermatology, Vanderbilt Clinic, New York; etc. Octavo; 482 pages; illustrated. New York: THE MACMILLAN CO., 1921.